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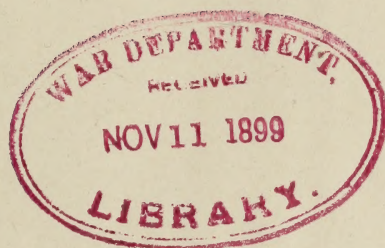
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ANTHONY'S

Photographic Bulletin.

VOLUME XXI.

1890.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., Editor.

ARTHUR H. ELLIOTT, Ph.D., F.C.S., Associate Editor.

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The Young House

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor*.

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor*.

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TONING AND TONING BATHS.

THE difficulties that many photographers, both professional and amateur, appear to have in the matter of toning albumen prints leads us to believe that a review of the various methods in use at the present time will be of service.

Beginning in the first place with the philosophy of the process we may start with the principles upon which it depends. The print as it comes from the frame contains the chloride of silver, darkened by the action of light, together with the same compound that remains more or less white according to the amount of protection it has received from the negative. The character of the print is also influenced by the strength of the silver bath used to sensitize the albumen paper upon which the print is made. A strong bath requires a longer time in floating the paper than a weak one would, because the greater strength of the solution causes a quicker coagulation of the albumen; and in this case also the picture is more upon the surface of the paper than when a weak silver bath is used. To our mind prints made on a moderately strong bath, say 60 grains to the ounce, are more brilliant and desirable than those made with less silver nitrate in the solution.

Since the light acts upon silver chloride and sets free chlorine gas it is well to have some substance present to catch this gas and combine with it. The well-known fuming process discovered by the late H. T. Anthony serves this purpose. And as Professor Hitchcock has recently shown in the BULLETIN that the amount of chlorine liberated is quite considerable and far more than was formerly suspected, a liberal fuming of the paper just before printing is not only practically important, but scientifically correct. It is generally supposed that the silver nitrate, always present in the albumen paper in excess, also serves to take up this separated chlorine. But even in this case other products are formed which are well taken care of by the ammonia in fumed paper, and much more satisfactory results are obtained.

The print then is essentially a reduction compound of silver in combination with albumen, and if this print is placed in hyposulphite (thiosulphate) of sodium solution to fix or dissolve out the chloride of silver not acted upon by light, a disagreeable yellow-red color is imparted to it. To change or prevent the formation of this color is the object of toning the silver print.

The conversion of the darkened silver compound into some other compound not changeable under the action of sodium hyposulphite (thiosulphate) may be effected in a variety of ways owing to the peculiar property that the dark substance has of reducing certain metallic solutions. But at the present time we must confine our attention to what is called gold toning, or the replacement of more or less of the darkened silver compound by metallic gold. The color or tone of this gold deposited on the silver compound depends upon the circumstances under which it takes place. As the tendency of the darkened substance is to turn reddish in the fixing bath, it is obvious that the color of the toning metal should be blue if the shade of the finished print is desired to be purple.

In order to influence the color of the print several circumstances and chemical reactions have to be regarded. In the first place the toning, and also the fixing operations both reduce the density of the original print to a very marked extent, and it is extremely important to get an approximate estimate of this reduction in the mind in order to carry the printing to such a point as to allow for this bleaching or fading of the print. In the next place the presence of a small quantity of free nitrate of silver in the prints appears to assist in the process of toning. It is, therefore, not to be recommended to wash the prints too much before they are placed in the toning bath; two or three changes of water are generally sufficient. Here also we can influence the color of the finished prints to a very marked degree. If we put a very little acetic acid into the washing water the finished prints will be of a more strongly red tone than without the addition of acid to the wash water, this addition turning them distinctly red. Salt placed in the wash water has a similar effect, but not as strongly marked. If, on the other hand, black tones are desired for the finished prints, a little ammonia, just enough to turn red litmus paper to a blue shade, may be added to the wash water before toning. This will preserve the brown-black tone of the original prints, and the toning bath will intensify it and make it of a brilliant indigo shade. Of course much depends upon the depth and character of the original prints, black tones requiring deep printing from brilliant negatives.

Yet another important point is the rapidity of toning. A toning bath that works rapidly will give blue tones; one that works slowly, red or brown tones. This comes from the fact observed long ago that fine metallic gold precipitated rapidly has a decided blue color, while gold that is precipitated slowly is red. It therefore follows that to give a purple tint to albumen prints, the original washed prints should be a little reddish, and a gold toning bath should be used that works rapidly. If, on the other hand, reddish or brown tones are desired (as for landscapes), then a slow-working gold bath should be used.

The philosophy of the toning process is quite simple. Upon the albumen print we have, in the darkened silver chloride, a powerful reducing agent, an agent capable of precipitating the metal gold from its solutions under favorable circumstances. In practice it has been found that gold chloride, either alone or combined with sodium chloride (common salt), is the most desirable compound to use; and when a print is immersed in a solution of gold chloride, metallic gold is precipitated upon the darkened parts, while hydrochloric acid passes into the solution. This acid has been found to have an injurious effect upon the toning process, restraining the action, and it may entirely prevent it. Now, the chemist knows of several acids that are weaker than hydrochloric acid and which this latter will drive out of their salts. Acetic and carbonic acids are two of

these. If therefore we add a carbonate or acetate to the gold bath, the hydrochloric acid, separated by the action from the gold chloride, will decompose the carbonate or acetate present, and carbonic or acetic acid will be set free, as the case may be. It is found that these acids have no important effect upon the toning process, at least they have very much less than hydrochloric acid.

A toning bath is therefore composed of a gold salt, an acetate or carbonate of an alkali metal or both, and some sodium chloride, which appears to clear up and add brilliancy to the final tone.

A few practical figures may be added here. One grain of metallic gold will tone a sheet of albumen paper (18 x 22) when printed. This is true for a large number of prints; in smaller quantities it is better to allow $1\frac{1}{2}$ grains of metallic gold to a sheet of paper.

In regard to the quantity of gold in a given volume of bath this may be as low as 1 grain of chloride in 10 ounces, and as high as 3 grains in 11 ounces. Both carbonate and bicarbonate of soda are used to make the bath alkaline and in quantity vary from 4 grains in 8 ounces to as high as 10 grains in the same volume. Acetate of soda is used in quantities from 10 grains to 30 grains in 8 ounces of water; and baths containing it should only be used after being mixed for a day or two; it gives warm brown tones. Chloride of lime (bleaching powder) is used in quantity equivalent to the weight of gold chloride, and in cases where the acidity of the bath is neutralized with chalk (carbonate of lime) added in excess, and after standing many hours with occasional shaking is filtered out. In the latter case blue tones are obtained, and if reddish tones are desired sodium acetate, in quantities given above, may be added, and the bath also allowed to stand. Borax and sodium phosphate are used in some formulas, but the baths do not keep, and there does not appear to be any special advantage gained in using them.

From what we have said above any of our readers can make up a toning bath to suit his special needs, and it is unwise to use the same bath for every class of work. Landscapes, and some classes of portraits, appear best with brown tones; while other portraits, and a few landscapes, may have a more pleasing appearance with blue or black tones.

EDITORIAL NOTES.

THE new eoside of silver plates have been used to make negatives of a rare variety of orchid, showing different shades of yellow, blue and green. Using the ordinary pyrogallol developer, the results are pronounced most excellent.

THE Cornell Camera Club has elected the following officers for the ensuing year: *President*, E. M. Charnat; *Vice-President*, C. B. Brun; *Treasurer*, S. J. Larned; *Secretary*, J. F. Skinner.

A REPORT comes from Warren, Penna., that Mr. F. P. Cobham has succeeded in perfecting an apparatus for making photographs of the interior of gas and oil wells at any depth. This, if really practicable, will develop some interesting facts relating to the effects of torpedoing wells, as well as the position of lost drills and tools. The details of the apparatus are kept secret at present, but it is known to be a combination of photography and electricity.

A NUMBER of Wisconsin amateur photographers organized the "Milwaukee Camera Club" on January 2d last. An entertainment was given by the club at the Atheneum, Milwaukee, on that evening, which was well attended. Mr. Thomas Spence, the President, made an address setting forth the objects of the organization, and Mr. J. B. Bangs exhibited some fine lantern slides. Mr. Howard C. Tilton read a paper on photography, while Professor Thomas Fillmore and Mr. Robert Shape gave piano and violin solos. A flash-light picture of the audience was also taken. We must congratulate our good friends in Milwaukee upon their successful start, and hope to hear of much good work from them.

MR. C. STACHOW, in Chili, sends us two excellent aristotype prints of views he has taken in South America, made with a cheap outfit and a single landscape lens. One is a view in Valparaiso Bay, showing the shipping and the bay towards North West Point, which the ships have to round in coming from Europe. The other picture is a view in the Cordilleras. Both prints are about as fine pieces of photographic work as one could wish for; clean, full of details, and remarkably brilliant. They show the perfection of modern photographic apparatus, even of the cheaper grades, when placed in intelligent hands.

At the annual meeting of the Lynn Camera Club the following officers were elected for the ensuing year: *President*, W. H. Drew; *Vice-President*, J. N. Smith; *Recording Secretary*, J. W. Gibboney; *Corresponding Secretary*, W. A. Porter; *Treasurer*, E. F. Bacheller; *Librarian*, Dr. E. Williams; Executive Committee, two years, W. B. Gifford; Executive Committee, one year, W. H. Russell.

THE New York Camera Club held its first annual meeting on Wednesday, January 8th, at 314 Fifth avenue, New York City. Reports of the President, Treasurer and Secretary, and the Executive Committee, were read; and changes were made in the By-Laws reducing the annual dues and admitting as members the members in good standing of other incorporated societies without the payment of initiation fee. The election of officers for the ensuing year resulted in the selection of the following gentlemen: *President*, Mr. David Williams; *Secretary*, Mr. H. T. Duffield; *Treasurer*, Dr. Robert J. Devlin; *Executive Committee*, Dr. H. G. Piffard, W. Townsend Colbron, and W. J. Cassard; *Trustees*, Dr. E. P. Fowler, Mr. Thomas Manning, H. J. Hardenburgh, C. Volney King, and Franklin Harper.

A REPORT comes from Germany that a new bromide of silver paper, without gelatine, has been invented, and proves to be very successful. We shall await the arrival of further details with much interest; at present it has been used for enlarging architectural negatives and portraits in a very satisfactory manner.

AN unusually large attendance of the members of the Rochester Camera Club took place at the annual meeting, January 9th last. The reports of the treasurer and rooms committee were presented and showed the club to be in better financial standing than ever before. The annual dues have been increased from \$2 to \$5. It was decided to hold the meetings of the club on Friday evenings instead of Thursdays as heretofore.

The following officers were elected for the ensuing year: *President*, G. H. Croughton; *First Vice-President*, Henry Turner; *Second Vice-President*, S. H. Lowe; *Secretary*, J. L. Willard; *Treasurer*, Henry Matthews.

THE Postal Photographic Club has now entered upon the second year of its existence since the reorganization, and the first monthly album is making its rounds. It contains fifty-six pictures of all shapes and sizes up to 8x10. The number of bromide prints is unusually large, there being twenty, among which are some of the most acceptable in the album. Quite noticeable among the bromides are "The Last Load," by W. H. Walmsley, and a brisk boating scene, "All ready; let 'er go!" by J. M. Walmsley. Dr. Mueller has a fine interior on albumen paper, and both he and Mr. Le Breton contribute portraits equal to a high professional standard. There are half a dozen platinotypes, among which Mr. Jackson's "Refreshments in the Field" is specially noticeable as reaching the plane of modern high art. The membership list has been increased by three names during the last month, but the complement of thirty is not yet full. Dr. J. Max Mueller, of West Chester, is the efficient Secretary of this excellent club, whose members are scattered from Rochester to Washington.

THE Society of Amateur Photographers of New York will give a lantern exhibition and concert at Chickering Hall, on Wednesday evening, February 5th, at 8 o'clock. The entertainment will consist of three parts: Picturesque New York, Musical Selections, and Paris and the Exposition of 1889. Tickets can be had at the rooms of the Society, 122 West 36th street.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Schirm's New Lightning Gallery.

WHAT is the latest novelty in German photography? Answer: The lightning gallery of Professor Schirm in Berlin. The event hinted at by us repeatedly, of the establishment of a Blitz gallery dispensing entirely with daylight, has at last become a fact, and immense progress in photography has been made thereby, which cannot be estimated highly enough, particularly during the present dark days of winter and the holiday season. The Instantaneous Blitz Gallery has been open since December 1st, under the modest title of "Gallery for Artistic Portraits," Potsdam str. 20. This Blitz light is employed not only for taking negatives but also for the production of prints. This is a still greater progress, the negatives being of not much advantage, if the cloudy winter-days make printing an impossibility.

Our advice to apply the Blitz light, if not rejected, at least met with indifferent consideration, and thousands of reasons were brought against it. We have here an artist, one of the best in his profession, and at the same time a clever amateur of photography, and he accomplishes what professionals would not risk to touch, and in such a masterly manner, that every one who has seen his establishment must be at once convinced.

It was no easy matter for Mr. C. C. Schirm to train his operators for this entirely new mode of photography. He has succeeded because he is not easily disconcerted.

Schirm's gallery is one of the usual elegant dwellings on the first floor, with a small hall and ante-chamber serving as a reception-room, two rooms which are arranged as Blitz galleries, and a large passage-room with one window, into which daylight penetrates only from one corner, and which bears the name of "Berlin room," as an authorized Berlin peculiarity.

This ordinarily partly dark Berlin room forms the large Blitz gallery for groups. Each of these rooms has, so to speak, a firmament of Blitz lamps.

Schirm's lightning apparatus is known. He works, as Piffard has done before him, by blowing magnesium powder through the flame with an apparatus; but while Piffard applies large quantities (more than 1 gram) he proves that a minimum quantity, 0.03 gram ($\frac{1}{30}$ grain), is sufficient for one sitting, and that more is rather injurious than useful. This apparatus is excellent for single pictures, but not sufficient for larger views in grand style. Here it is oftentimes necessary to apply 7, 8 and even 15 to 20 lamps, and to ignite these simultaneously, the latter being of great importance. It is also important not to let the lamps be too near to the subject.

In Schirm's gallery they move therefore on rails, about four meters from the floor and near to the ceiling. Each lamp consists of a Bunsen flame, through which the magnesium is blown, and an illuminating flame, which serves for studying the light effect of the lamp. Some of the lamps are ignited in front of the subject, others from the side. The arrangement is such that the ceiling contains a system of rails, which might remind one of the game called "Mill." An exterior square of rails are placed round the four walls, and in the small room an additional inner square of about half the size. In the Berlin room, intended for groups, is a third and still smaller one. Upon these rails the lamps can be moved at will. Each lamp carries gas tubing and a tube for blowing, which are connected with the main gas pipe and also with the bellows.

This rather complicated system of tubing swinging from the ceiling leaves a peculiar, still not disturbing, impression at first sight. In the small room I counted fourteen on the exterior square, eight on the inner one. In the large room there were sixteen lamps outside. Each lamp (illuminating burner as well as Bunsen burner) had a cock with a long lever, which from the floor could be opened and closed with a pole-hook. Above each lamp burns continually a small igniting flame, from which the gas will ignite by opening the cock. The Bunsen burner is in connection with a small magnesium powder reservoir, which, on being closed, after ignition of the powder, will drop a new, small quantity of $1\frac{1}{2}$ centigram of magnesium into the blow-pipe for the next view. A larger quantity of magnesium has not been found effective; if more light is required, more lamps should be used.

At a single sitting we saw nine lamps in activity—four from the side, four in front, and one from the other side almost behind the sitter. Most of the negatives are taken on old, extra blue sensitive plates, the magnesium light containing mostly blue rays. A mechanical electrical arrangement is used for the exposure, which, after the subject has been posed, opens first the flap on the objective and immediately afterwards sets the blowing apparatus to work, which blows the magnesium powder through the flame, after which it closes again the objective flap, all by electrical movement.

The whole system is so neat and well executed that we cannot sufficiently praise the inventor.

The blow-light itself is not instantaneous and lasts about one-half second, but the time of the objective shutter is only about one-tenth second, so that the exposure can be considered as instantaneous.

It is remarkable that all brands of dry plates have not proved equally good and effective. The sensitive Bernaert plates cannot be used at all. Voigtlander's Euryscope, Series III, second diaphragm, was used as an objective.

It remains a fact that a well-exposed negative was obtained. It may have had a pretty strong top-light character, according to the judgment of some; but that pictures can be obtained of faultless illumination is proved by Delden's magnesium Blitz pictures, *Photographische Mittheilungen*, 1889, May 2.

It is also evident that in such a room one is enabled to utilize every place, under the window, the piano, the stove, near the door or in any corner, for posing the subject, so that more change in the artistic arrangement is possible.

The decoration of the whole room should of course be selected and graduated photographically, and if this has not been done, it is an error which can easily be remedied.

The Blitz printing process is also interesting. This was executed on bromide paper. To prove that paper copies could be obtained at once, Professor Schirm pressed a piece of paper upon a gelatine negative, quite wet, and washed only for ten minutes, placed this upon a table arranged with a measure (rule) opposite a vertical ground glass at a distance of about 120 cm., and ignited behind it, with his military Blitz lamp (which is commonly used for signaling), a flash of 1½ centigrams of magnesium powder. This was sufficient to obtain, with eikonogen development, a well exposed print. It is peculiar how the character of the pictures and their tone changed by placing the negative nearer to the light or further off. Those near-by appeared browner and softer.

Ordinarily the prints are made after the negative is thoroughly dry and has been retouched, and a dozen cartes-de-visite can easily be printed with one flash. The tone of the prints I saw was perhaps a little too cold, but warmer tones can easily be obtained by a change in the lighting and development. Dr. Just's book, "Guide for Positive Developing Processes," gives the desired information. By the powerful action of the Blitz light it is shown that two flashes were sufficient to obtain a very intense positive from a drawing on bromide paper. Prints from these flash negatives can, of course, also be made by any of the other processes, so that in this respect no objection can be made to them.

Mr. Van Delden is fitting up another Blitz gallery in Breslau, but Mr. Schirm deserves the merit of having been the first to introduce this new kind of Blitz gallery.

This is certainly a new step forward in photography. Emancipation from daylight and emancipation from time, and I am convinced that this will have considerable influence on the progress of our beautiful art.

BERLIN, December, 1889.

PHOTOGRAPHY FROM A WOMAN'S STANDPOINT.

MISS CATHERINE WEED BARNES:

[Before Society of Amateur Photographers of New York.]

I HAVE been asked to say something to-night on photography viewed from a woman's standpoint. Having trained myself to look at it simply as a worker, you must pardon me if I, occasionally, in the interest of the subject, step off

my own special platform. I can only excuse myself for saying anything by the fact of my absorbing interest in this work; combining, as it does, the exactness of scientific truth with the keen pleasure of artistic effort.

Less than four years ago I set up my first camera after much study and many conjectures as to where the image would appear. If discouragement was possible it would have come that first year, for even my inexperienced eyes could see the work was poor. Then acquaintance with a professional friend who knew how to criticise sharply began to have its due effect, and, by his advice, I joined this society nearly two years ago, as the camera club in our benighted City of Albany does not admit ladies. It was a fortunate step for me, as words cannot express my gratitude towards this society for the numerous benefits received from it, and I only wish it were possible to oftener attend its meetings. (In this connection let me thank you for granting my application to become an active member.)

In the course of what my friends are pleased to call a "craze" I have found that eye and mind have gained, the one, new power of observation, the other, a broader delight and appreciation of the world about us. Every step in city or country now presents a picture that once would have been overlooked, and every long journey is fuller than ever before of pleasure and benefit. While previous work in art schools and painters' studios has not been wasted, it has yielded place to the mysteries of the dark room and the subject is viewed through the sharp eye of a long or short focus lens as may be required, for side by side with the love of art was a latent love of science. It might be called a case of transferred affection, for my hydrometer and graduates seem as beautiful now as once did a new set of brushes and palette, while my myriad collection of bottles, scales, etc., rival the finest colors from Schoenfeld or Winsor & Newton. No knowledge, we are told, is ever really lost, but it sometimes performs a kind of transmigration into some other branch of learning. The training gained in various reading and dramatic clubs has many times aided me in posing a sitter as well as preparing to take an interior.

Speaking from a woman's standpoint I must confess that landscape work is not ordinarily pleasant, especially in cities, where the ubiquitous small boy predominates and seems to rise from the earth at sight of a camera. This and other annoyances do not apply to interiors which, though difficult work, are exceedingly satisfactory when well done, and which make peculiarly suitable work for ladies who possess the requisite taste and patience. I must say that very few people, except practical photographers, really appreciate the best points of a fine interior, and do not realize that the picture, to take which one has had to purchase an expensive lens, and spend the greater part of a morning or afternoon in focusing, exposing and developing, to say nothing of the subsequent printing, etc., is worth any more than the chance shot of the most ordinary snap camera. Interiors have been shown me with vertical and horizontal lines on what might be called the bias; furniture deprived of all visible means of support, more or less halation, and, if figures were introduced, placed so that the light directly faced them. It seems to me that this branch of photography has by no means received proper attention, and that it is exceedingly valuable in its results.

More difficult still, and therefore more interesting, is portraiture, from the simplest out-door view to the most carefully posed sitter under the skylight.

Human nature takes on very odd phases, and one needs the eyes of Argus and the patience of Job to see that the work is well done. But there is excitement and thorough satisfaction in a well-taken portrait, especially if the subject admits of being dressed and posed to illustrate some historical, mythological, or other fancy of the artist, when, if sitter and artist are "*en rapport*," a world of beautiful ideas may be evolved.

Mr. Seavey painted two of my backgrounds in soft shades, but left the third for me to draw my own designs to be removed when desired for others. There is a rod with rings in front of and high above the backgrounds on which to hang curtains, while rugs, furniture and the conservatory are laid under contribution when needed. No trouble is too great when it is repaid by a good picture. Three out of my nine lenses belong in the studio. One is a 3B Dallmeyer for large heads, and the two others are Voigtländer Euryscopes, one of which is the new W. A. Portrait and Group lens. This last has proved absolutely necessary, as my studio is only 9 x 19, and with it I can take a full-length panel figure at less than eight feet distance. All my developers are made in the dark room near at hand by hydrometer and scales, and I have just built an emulsion closet for coating lantern-slides. My other lenses are three Dallmeyer, one Ross, one Optimus and one Morrison. Having a good lantern, I generally try my slides before submitting them to your keen scrutiny. My first test-night experience here was very instructive. I had requested that my name be not mentioned, so that the full benefit of your unbiased judgment might be given, as it was very fully, to my edification and profit. I am a thorough believer in lantern-slide exhibitions, and enjoy making slides, as it is much easier than developing negatives. Here let me testify to my intense respect for eikonogen; no other developer shall henceforth touch my slides. I believe thoroughly in its future capabilities, but have only tried it on slides and bromides. I use a single solution, and it requires careful management from the first to the last step of the process, as its rapidity of working seems marvellous. My only lesson in slide-making was watching Mr. T. C. Roche expose and develop one, and I was then told to go ahead, which I have tried to do ever since. I have seen very little of other ladies' photographic work, but have sought for information wherever it could be found, especially here, where the feeling of comradeship is strong enough to lead many of you to take infinite pains with beginners like myself. Such treatment contrasts forcibly with that of a recent writer in the *Photographic News* signing himself "Perplexed," who gives a number of objections to lady photographers enjoying club privileges. Those of you who see the *American Amateur Photographer* may find some comments on the above-mentioned writer's statements in the December number.

One point more and I have finished. There is a suggestion I would like to make to our representatives on the Joint Exhibition Committee. It may possibly be favored by no other lady competitor, perhaps not by the committee, but I wish to urge it strongly. It is to abolish the so-called "ladies' diploma or prize." My reasons can be briefly stated. It is not a complimentary distinction, although intended as such, and is considered by outsiders as implying that the lady who wins it competes only against other ladies, which greatly lessens the value of the prize. If I had known before receiving it, at Boston, that at the same time a prize for a special subject was to be given to another lady I should have hesitated about accepting the diploma. Good work is good work whether

it be by man or woman, and poor is poor by the same rule. If the work of men and women is admitted to the same exhibition it should be on equal terms. Do not admit a woman's pictures because they are made by a woman, but because they are made well. If the work is poor reject it, and do not, when she wins a prize, allow the inference to be drawn that it is hers only by courtesy, but let her feel that she has won it fairly in a clear field. You admit women to your deliberations; place their work on your walls and on your lantern screen. Can you not offer your prizes simply for certain kinds of work, and allow the question of sex to be laid aside?

[From *Photographische Correspondenz*.]

THE INVENTION OF AUTOTYPY.

BY C. ANGERER.

It is seldom that an invention from its very beginning appears complete in all its details, as it generally requires a great deal of brain work, with usually only partial success and much disappointment.

If we look at any technical process it appears to us so simple that we can hardly comprehend under what difficulties and mental labor such an invention was made. So it is with the invention of autotypy.

Lichtdruck, photo-lithography and helio engraving had already been invented, and one was even enabled to multiply photographic views from nature on chromated gelatine plates, lithographic stone and by intaglio printing.

But the typographic printing process seemed to encounter unsurmountable difficulties.

To produce type from a photograph, consisting of lighter and darker tone gradations, or, in other words, a perforated or cut printing stamp like a woodcut, was a problem, the realization of which was doubted by a great many. Others again took it easier, in the opinion that lichtdruck existing, it required only a reversed negative from the same to be put on a zinc plate, from which the type form could be etched.

Nothing can be said against this theoretically, but for many technical reasons it cannot be done. It is possible to produce a grain in the lichtdruck plate, but this fine grain is by no means enough to locate sufficient spaces for the etching. A cliché for letter-press printing requires the etching to be made so deep that the deepened intersections will not completely fill up when the roller with the printing ink is applied. The same poor success was had with photo-lithography executed in half tones and with photo-engraving, or with processes based upon similar manipulations.

The reader would become tired by counting up only approximately the many processes based on the aqua-tint grain (photo-engraving), the so-called wrinkle grain (chrome-gelatine print), and etched grain upon lithographic stones (photo-lithography). With all these methods printing plates could be produced, but they would not stand the wear and tear, the form having to be washed out after a few prints were made, or the beauty of the picture had to suffer by application of too coarse a grain. The photographic picture left a disagreeable impression, and looked as if printed from a coarse sandstone.

After this the attempt was made to obtain from the photographic picture a type form like a woodcut by interrupting the solid tones by lines. An asphal-

tum copy (after the well-known asphaltum printing process) on metal, ordinarily a zinc plate, was provided with a very fine line arrangement and then etched.

Far better results were obtained from prints by placing fine sheets or collodion films with fine lines between the negative and the sensitive plates.

As one idea produced the other the process proceeded. The collodion films did not permit much pressure, were subject to bubbles, and left, therefore, indistinct spaces in the print, etc. To overcome these defects the lines were drawn on pretty large sheets of paper, from which a reduced negative was made, sometimes with the lines crossing in different directions. The negative so obtained was laid on the sensitive plate and inserted in the holder. This process gave fairly good results as regards complete pictures, but the highest lights could not be obtained; the shadows were also evenly interrupted, giving the picture a more or less flat tone. This process was applied by me in 1879, and we may consider it, and the so-called Ives process, as the immediate forerunners of autotypy.

The process introduced by F. E. Ives in Philadelphia in 1881, a photo-engraving process, met with much favor, and consisted in its essential parts in the production of a negative from the desired object, and the exposure of a chromo-gelatine film under the negative. The film is developed to a relief picture by washing in warm water and coated with white paint. The white surface was divided by Ives in lines and dots, by blackening a stamp made of rubber or similar elastic material, and provided with V-shaped conical indentations, and pressing the same against the white relief in different directions. The paint from the points of this stamp touches, of course, the elevations of the relief the most—they become, therefore, entirely black—and less upon the middle size elevations; the latter are blackened correspondingly less and form the middle tones; the intaglio parts remain free from paint, not being reached by the conical points. The relief picture, after this method, is fully executed in the proportion of its tone value in more or less black lines and dots, and may now be transferred on zinc with the aid of a repeated photo-negative, and may then be etched.

The greatest and most successful novelty in phototypic processes was introduced by Meisenbach in 1883 with the so-called double transfer process (invented by him) and interrupted exposure, called autotypy.

Meisenbach demanded the original negative to be sent to him; if this was not to be had one was made from the albumen print. This negative formed the foundation of Meisenbach's so-called double transfer process, by producing from it a diapositive and insertion of line arrangements in front of the same, from which the zinc plate was made by transfer.

The most essential points in the Meisenbach process are the insertion of line arrangements and interruption in the exposure.

Many of my friends could see nothing new in Meisenbach's invention, and pressed me to defend the priority of the invention; still I called attention to the decided peculiarity of his process, the misplacement or changing of the inserted line arrangements during exposure of the negative.

This manipulation is important for the success of autotypy. Without interruption or changing of the negative, that is applying only one negative, even if with cross lines or in different directions, an evenly good result is never obtainable.

Whatever is covered and, so to speak, cut out of the details by applying the first line arrangement, is replaced to the largest part by the second exposure, following thereafter in diametrical direction.

Any practical photo-mechanical printer will know how to esteem the extraordinary significance of double exposure aside from the generally necessary intensification.

The purely mechanical proceedings of the autotype process as applied by Meisenbach were of course still very complicated and expensive, according to the manipulations described by him.

In the same year I succeeded in constructing an apparatus with a peculiar plate-holder, being so arranged that the exposure could be interrupted at will, thus allowing a displacement of the lines in front.

The holder of this apparatus rests on two steel points, and is held fast so closely with clamps that it is possible to expose a pen-and-ink drawing at several intervals, while the holder may be taken off the apparatus and replaced again as often without the least disturbance or lack of sharpness in the drawing.

Thereby I obtained great advantages. The double transfer was unnecessary, and the first exposure from the original gave me at once an etched negative, which was decidedly sharper than those obtained by repeated transfer.

Almost about the same time Meisenbach decided to apply a similar process in preference to his first method.

A further change in the purely mechanical part of the autotype process was also made in France.

Gillot, Boussod and Veladon, Lefmann and others in Paris discarded the movable camera. They fastened the objective to a suitable place on the wall in the dark room, and the original was put on a movable tripod in the light space in front of the same. In the dark room is also the sensitive plate on a movable stand. While the objective is covered and the exposure is thus interrupted, the changing of the hatched designs may take place without moving the sensitive plate from its position.

The main conditions after Meisenbach will therefore be recognized here, the interruption of exposure and simultaneous changing of the hatched lines being adhered to.

Finally, I may mention the line system of Kurtz, in New York, produced in the most perfect manner; they are drawn on a peculiar ground, upon plate glass under water. Not everybody may know what perseverance and patience is required to produce a suitable lining for autotypy. I have tried every existing system of line machines, constructed new ones, and worked them for years before I succeeded in producing a faultless lining system, the beauty and correctness of the autotype depending entirely upon extremely even, sharp and faultless lines.

The autotype process in its present complete state has become one of the most favored and indispensable means of book illustration, and is used by a great many journals and newspapers.

AND SHE MEANT IT.—He (enthusiastically)—I love everything that is grand, beautiful, poetic and lovely. I love the peerless, the serene and the perfect in life.

She—How you must love me, darling. Why did you not propose before?

THE JAPANESE THROUGH THE CAMERA.

BY ROMYN HITCHCOCK.

[Notes of an Address before the New York Camera Club.]

THE lecturer began by showing a map of Japan and briefly described the general aspects of the country and its climate. Speaking of the latter, he said: "There is a restful charm about life in Japan which no one can long resist." Then followed a brief description of the Island of Yezo, which is the home of the Anios, a peculiar race of people distinct from the Japanese and fast becoming extinct. The slides which illustrated this part of the lecture were particularly interesting. They were from negatives made by Professor Hitchcock personally, and were uncommonly well done. They consisted of views of the Anios people, their country and their dwellings; and were full of interest to all who saw them, as few travelers visit these people, and the photographs of them shown at the New York Camera Club are probably the first ever made of this interesting variety of the human race.

Following these pictures came views of the pit dwellers of the island of Shikotan, the remnant of another peculiar people, visited by the lecturer, who was the second white man that ever appeared among them. The peculiar dwellings of earth, heaped up over excavations in the ground by these people, were curious and interesting, as also were the pictures of the people themselves.

A view of the city of Yokohama, a city of 65,000 people, was next shown. The foreign population of the town is about 3,000, and confined to a kind of reservation specially set apart, and called the "Concession."

Professor Hitchcock gave an interesting account of the myths and legends of the Japanese which have developed into the Shinto religion. In this religion there is no reward after death, the great object of life being to gain happiness in this world.

The religion of Buddha is also followed in Japan, and the remains of the ancient temples are still beautiful.

Views of the great city of Ozaka, for two years the residence of the lecturer, were now shown. This ranks second in point of size among the cities of Japan, Tokio being the first. It has been called the Venice of Japan, being cut up by streams crossed by numerous bridges. A picture of Jentei's hotel in Ozaka, the principal foreign hostelry, was also shown, together with interior views. Then followed views of the temple; scenes from the verandah of the hotel, showing the boats and craft on the streams; a Japanese tea-house; a Japanese gentleman at tea, seated on the floor, with brazier, iron kettle, and low stool-like table, upon which appear saki bottles, tea cups and chopsticks; a Japanese boy writing on the same kind of low table, and kneeling. After a number of other interesting views of the city and people of Ozaka, the lecturer exhibited pictures of Nimo Glen, with its beautiful cascade; the peculiar conveyance of Japan, the jinrikisha; and Buddhist temples at Yamato and Shigisan. These latter were interesting interiors seldom seen by foreigners. Next followed pictures of Buddhist and Shinto priests; a Shinto festival at the Temma Tenjin; various pagodas; a Buddhist monastery; Buddhist priest's dwelling; and the feudal castle of Korijama, with its wonderful stone walls containing masses of rock so large that it is not now known how they were handled by the ancient Japanese.

Excellent views of the Buddhist monastery of Horinji, with its pagoda, were also shown. These are the oldest wooden structures in Japan, having existed

twelve and a half centuries. From the interior the lecturer exhibited a flash-light picture of the ancient paintings on the walls, a relic of early Japanese art.

The city of Nare was also well illustrated, together with its great image or idol of Buddha, 53 feet high, first cast in the eighth century; its temple, and the gardens around the shrine.

Kyoto, another Japanese town in the western section, visited by the lecturer, was long the seat of learning and art. It is now noted for its silk embroidery, cloissoné, and certain porcelains. Views of the city, its streets, people, temples and gardens were exhibited. A particularly fine view was shown of the Kiyomidzu, from which a landscape of great beauty can be surveyed. Built on the brow of a hill, the supporting scaffolding is at once a wonder in architecture and Japanese skill in wood-work.

Interesting slides were also shown of the beautiful gardens of the Japanese people, their interesting culture of dwarf plants and fruit-trees, such as the orange. Window-garden culture is very common.

The picturesque region of Nikko, a great resort of the foreign residents in Japan, was also exhibited, together with its temples and tombs.

A number of interesting pictures of Japanese women were shown, singing and dancing girls, and players on the samasin. The dresses on special occasions are very gorgeous; but ordinarily the women dress in a very subdued style.

Quite a number of interesting slides were shown illustrating agriculture and an excellent system of irrigation followed in Japan. Also the manufacture of saki (rice-wine); the gathering of tea, rice, rape and barley. An excellent slide of a sugar-mill, turned by oxen, was also shown. Another interesting slide was a picture of a Japanese woman working a primitive cotton-gin.

Altogether the exhibition and lecture was one of the most interesting ever given in New York City; and should our readers have an opportunity of seeing Professor Hitchcock's pictures and hearing his description, we strongly recommend them to take advantage of it.

[From the *Photographic Review*.]

"AT HOME" PORTRAITS AND GROUPS—THE FURTHER EXPERIENCE OF MR. W. H. HARRISON.*

MANY exceedingly pretty effects in lighting are to be obtained in an ordinary drawing-room. Amongst others, I would mention specially the kind of picture known amongst photographers as the Rembrandt. When light and shade are correctly balanced this is a most pleasing and artistic style of photography, and one in great demand. It is more especially suited for studies of the head and bust than for three-quarters or full-length portraits, except when our sitter is attired in white; then the details of the drapery are sometimes more easily rendered by the figure being placed in shadow.

In order to produce a successful Rembrandt, it is of the first importance that we pay careful attention to the matter of lighting, that we may have a correct proportion of light and shade. If the lighting be strong and direct, then we must have much reflected light; if weaker, or more diffused, a lesser amount of reflection will suffice. In all cases we ought to avoid reflected light being used in such a manner that it can be detected in the resulting picture as such.

It is desirable that the reflecting sheet be not placed too near the face of the sitter, and that it be brought fairly well to the front. The operator will do well to make a final inspection and overhauling of the lighting previous to exposing the plate, in order that any defects, which on a close inspection are discernable, may be rectified, such as false lights reflected in the eyes, heavy shadows caused by prominence of the nose, etc. When exposing on such a picture the great amount of shadow ought to be taken into consideration, and a due allowance made in the length of exposure. The two most common causes of failure in Rembrandts are violent contrasts of light and shade, and under-exposure. For home work, the one has to be overcome by a judicious use of reflectors; and the other by an exposure, the duration of which our experience and judgment must determine.

It is desirable to be provided with a vignette background, the wall paper frequently being of so conspicuous design as to be altogether unavailable for the purpose. Even when the paper is quite plain there are sure to be shadows on it near the window, which make vignetting a difficulty. In choosing a background, select the lightest you can find, remembering that the weaker light of the drawing-room requires a lighter background than is necessary for the studio. Let the roller be attached to the top of background, with a cord for hanging, like a map or picture. I find it more convenient to dispense with the rod or lath at the bottom, as it is so constantly in the way. By providing ourselves with an extra stand, as previously described, we have the choice of the two methods of hanging the background. Sometimes the stand will be useless on account of the limited space behind the sitters; and at other times it will be desirable to use it; as, for instance, when the background is required away from the wall.

Never attempt this kind of work with a view lens when you are the possessor of a portrait lens. The latter is far and away the better. When we take into consideration the small amount of light with which we have to work, the frequent demand for the photographing of children "At Home," and the necessarily close proximity of the sitter to the background, and other articles more or less obtrusive, we shall readily see that a view lens is not suited for the purpose.

When photographing a full length portrait or group, the background is often quite unobtrusive if rendered by a portrait lens, but if a view lens is used, it is glaringly objectionable. The same applies to picture frames, vases, curtains, etc.

With regard to accessories, the drawing-room usually abounds with them, and I have never experienced any difficulty in this direction. Flowers, grasses, and other articles useful in the making up of pictures, are often more abundant here than in the average studio. With fresh accessories and home-like surroundings, new and natural poses suggest themselves; and the work, as far as posing and picture making is concerned, is a delight. If we are photographing children, the children know that they are at home, and the freedom of speech and action allowed at home are difficulties far less than the inquisitive conduct of the older, and the half-terrified condition of the younger members, when visiting the strange studio.

To ensure success, be provided with a quick-acting portrait lens, and plates of the greatest rapidity, combined, of course, with the other qualities which constitute a good plate, and the difficulties of the situation are half overcome.

A plate which gives a full round image with abundant detail in the shadows, without being unduly forced, is the class of plate to be used for the work.

In making the exposure, the operator should not forget to take into consideration the color of the wall-paper, carpets, hangings, etc. When there is a fair amount of light in the room, it is often robbed of much of its actinic power by the yellow or red tone of the room, and is quite misleading to the inexperienced.

Under-exposure, being the most common fault in photographs taken under these conditions, ought to be studiously avoided; hence, I would again urge that every available assistance to rapidity be made use of.

(To be continued.)

[From the Photographic Review.]

TESTING LENSES.

(Continued from page 560, Vol. XX.)

IN measuring the curvature of field of a lens as described in our last, the influence of the size of the diaphragm must not be overlooked, but before discussing the effect of this influence upon the determination of flatness of field, it is desirable to consider what is the difference which is created by the insertion of the diaphragm. That the insertion of a smaller diaphragm in a lens should make any difference in the length of its focus is a proof that that lens is not truly aplanatic, that is to say, that there is some spherical aberration. Spherical aberration being the main cause of want of fine definition at the center of the field, it is desirable to show how to test for its presence, and this may easily be done by inserting a small diaphragm after focusing with the full aperture, and then noting whether the focal length is altered thereby. If positive spherical aberration is present it will be found that on the insertion of the smaller diaphragm the focus is lengthened, and the lens must be turned out from the ground glass in order to obtain the utmost sharpness. The cause of this difference is that with positive spherical aberration the rays collected by the marginal portion of the lens come to a shorter focus than those which pass through the central portion. If the central and marginal portions of an uncorrected lens were used alternately, the difference of focus would show very markedly. As it is, by using first the lens with full aperture, we are employing rays of all the intermediate lengths of focus, and the image, although it cannot be truly sharp at any plane, will be at its best focus at an intermediate distance between the shorter focus of the marginal, and the longer focus of the central rays. When, therefore, the rays from the marginal portion of the lens are excluded by a stop (we are speaking of an image in the center of the field), the longer focused image given by the center of the lens is examined by itself, and the instrument appears to be of longer focus than before.

In portrait lenses the freedom from spherical aberration, and consequent fineness of definition is obtained by Petzval's device of having one lens in the instrument—the front lens of the back combination ordinarily—possessed of so much negative spherical aberration as to counteract the positive spherical aberration of the whole system. The effect of this correcting element is more or less powerful as its position with respect to the other component of the back lens is more or less distant. We have here therefore a valuable means of correcting the spherical aberration and consequent defective definition of a portrait

lens, by the simple expedient of altering the distance of the correcting lens. Suppose we have a portrait lens of the usual form, the definition of which is not fine, and we suspect spherical aberration as the cause. Focus some object, say a column of type, at the distance of the sitter, using the full aperture. Next insert a small diaphragm and focus again. If the lens has now to be turned out in order to obtain the greatest sharpness, there is positive spherical aberration, which may be remedied by separating the lenses of the back combination by a certain amount. If, on the contrary, the focus is shorter with the small diaphragm than with the full opening, there is negative spherical aberration, that is that the correction has been overdone, and it may be set right by placing the back pair of lenses closer together.

The lenses of the back combination are generally separated by a ring of blackened brass. If the distancing of them has been found by the test above-mentioned to be incorrect, a fresh ring, narrower or broader as the case requires, should be cut of the proper breadth. In order, however, to ascertain what this breadth should be, the lenses may be experimentally separated by using, in addition to the brass ring already in the cell (if further separation is required), a ring or two of card cut as narrow as may be whilst preserving its shape, or by a ring formed merely of a piece of clean smooth wire, and kept in position by its spring against the side of the tube. A more handy and complete way is to have three or four rings cut by a brass finisher from a piece of tube of the proper diameter. If these rings are of different depths, say from one-half to one-sixteenth of the depth of the piece supplied with the lens, they may by different combinations be made to serve for several experiments in distancing.

Another contrivance, for trying different distancing of the components of the back lens, consists of a spiral made of steel or hard brass wire, fitting between the lenses in place of the ordinary separating ring. To be effective there should be spring enough to ensure pressure against both lenses so far round as to secure their parallelism at any degree of separation. The lenses can now be gradually brought nearer by turning the screw of the cell until at a certain point it is found that the insertion of the diaphragm does not necessitate any alteration of focal distances. It may of course happen that the cell is not deep enough to allow of sufficient separation of the lenses.

With those portrait lenses in which the position of the components of the back lens is reversed, that is to say where the negative lens is placed nearer to the plate, positive spherical aberration is corrected by bringing the lenses nearer together instead of separating them.

[From *British Journal of Photography*.]

PHOTO-MICROGRAPHY.

BY ADOLPH SCHULTZ, F.R.S.E., F.R.M.S.

(Continued.)

HAVING briefly described the microscopical part of the apparatus, we will turn our attention to the camera. The number and variety of cameras used for photo-micrography is so great that I could not describe to you this evening even all the best known forms. Almost every microscopist arranges his photographic apparatus to suit his work and as his circumstances permit it. The smallest cameras are generally carried at the ends of the microscope bodies,

which arrangement has the advantage that the apparatus can be used both in a vertical and in a horizontal position ; but, as a rule, such a combination is not very steady unless the camera is either very small or is supported by a separate stand, such as Reichert's in Vienna, which consists of a heavy horseshoe foot provided with three levelling screws, carrying a stout iron pillar, on which a frame supporting the screen end of a small bellows camera can be adjusted in a vertical direction and fixed. There are a number of arrangements for dispensing with a microscope stand altogether ; in these a stage for the support of the object and the objective are attached to the front of the camera, but they are evidently only suitable for low power work, and if provided with stage motions, fine adjustment for focusing, etc., will be as expensive as a separate good and cheap microscope and a camera. I have seen a picture of such an apparatus of American manufacture, which had a powerful large paraffin lamp with three wicks attached to it. This is both theoretically and practically wrong, for we would project three images of flames parallel to each other on the object were a sub-stage condenser employed for the illumination of the latter. The smaller the flame the more have we command over the passage of its rays. Besides, a large lamp, especially if provided with three wicks, produces so much heat that the objective and object may be ruined by it. The exposures under low powers by lamplight are quite short enough even with a small flame.

Coming to some of the best arrangements, and those which are suitable for the highest powers, those of Dr. Maddox and of Colonel Woodward, whose work has not been surpassed, deserve mentioning. These gentlemen dispensed with the bellows camera altogether by darkening the room they wrought in completely, and allowing the sun's rays to fall only through a small hole in the window shutter after it had been reflected from a heliostat placed on a shelf outside the window. The microscopical image was projected by the objective and concave amplifier on a screen or on an easel similar to those used for enlarging on bromide paper, and this easel moved on rails. Seated by the side of the microscope and whilst controlling its adjustments, the image was viewed by means of a powerful short-focus telescope or field glass. The image having been focused sharply on a piece of white card, the latter was exchanged for a sensitized plate and the necessary exposure given to it.

The arrangement, which seems to meet nearly all requirements for photographing with any kind of light and with any microscopical objective, is the recent one of Dr. Roderich Zeiss in Jena, a son of the famous optician, Dr. Carl Zeiss, recently deceased. Dr. Roderich Zeiss is probably the most favorably placed photo-micrographer living, and it must be admitted that he has made excellent use of his unique opportunities. He has all the vast resources of his establishment and of the optical glass works in Jena, and the great knowledge of microscopical optics of Professor Ernst Abbé at his service, besides being himself an excellent and enthusiastic microscopist and photographer. Dr. Zeiss works in an isolated and uninhabited dwelling-house, in the ground floor of one of the rooms of which he has had sunk two large foundation stones. Upon one of these stones stands a firm iron tripod supporting an iron platform, which carries either the heliostat, the arc lamp, or the oil lamp, together with stands for various pieces of apparatus, such as iris diaphragms, alum tank for filtering out the heat rays of the sun, condensing lenses, and a fine microscope specially constructed for photographic purposes. On the other larger foundation stone

stands a long, square, iron table having four legs, which table supports a long bellows camera of two sections. The camera moves on rails, so that it can be either connected or disconnected with the microscope without delay. The motion of the fine focusing screw is imparted to it by means of a Hook's joint and a long rod, the end of which the observer holds in his hand whilst seated near the focusing screen. The focusing glass is attached to the screen itself by some movable supports. Provision is also made for placing one section of the bellows in a vertical position when the microscope is placed vertically. Two iron stools, which are adjustable in a vertical direction, the one standing near the microscope and the other near the screen end of the camera, enable the operator to make all the adjustments with ease and the greatest comfort.

Before Dr. Carl Zeiss made the large apparatus just described, I devised the simpler, but almost quite as efficient, apparatus which you see before you. It has been evolved gradually as my experience in photo-micrography ripened; and whilst my stand is not in the least ornamental, it seems to me to fulfill all the requirements of the photo-micrographer, besides being portable and cheap. My photographic bench is 8 feet long, 16 inches broad, and $8\frac{1}{2}$ inches deep; one end carries a raised platform 4 feet long for the support of the camera, and to bring its center in the optical axis of my large Ross microscope stand when the body of the latter is placed horizontally. This platform, to the underside of which are glued strips of India rubber to deaden vibrations, can be raised for the purpose of photographing with the stage of the microscope placed horizontally, in which case I employ a large rectangular prism above the cross-arm of the stand in order to reflect the image in a horizontal direction in the camera. The other end of the bench supports a round table 27 inches in diameter, which revolves upon its axis and serves to support the microscope, the lamp, and any other apparatus which I may require. The height of this revolving table from the ground is such that it enables me, whilst seated on a chair, to focus the object and arrange the illumination of it with the utmost comfort, previous to making the light-tight connection of the microscope with the camera. Under the revolving table and attached to the bench are five brass screws carrying little brass discs topped with India rubber, and by raising three of these the revolving motion is arrested, and the table is then firmly supported and can be leveled. Along the raised platform for the support of the camera runs a brass focusing rod supported by two short pillars on plates, which slide into dovetailed brass plates screwed to the bench. This focusing rod carries at the end, near the round table, a small grooved pulley adjustable in the direction of its axis. Over this pulley and round the wheel of the fine focusing adjustment is placed a thin elastic cord, and by these means the object can be accurately focused whilst its image is being examined on the focusing screen. The bench itself is supported at the ends by two pairs of legs and two stretchers, which are attached to it by only two screws, which can be instantly removed either for the purpose of transport or when it is desired to place the bench on an ordinary strong table. When photographing objects in fluid, or when using immersion lenses having an inconveniently long working distance, the microscope has to be placed in a vertical position, and as my reflecting prism is not so perfect as not to impair somewhat the sharpness of the image under the highest powers, I have constructed a very simple addition to my bench, which consists of two hinged boards held perpendicularly to each other by means of a stout stretcher. The

whole has to be fixed by means of two screws to the top of the platform. The camera is then fastened by means of two screws and brass stretchers to the vertical board, whilst the microscope and lamp are carried on the round turntable, which is now supported by a separate square table only 14 inches high. This arrangement necessitates, when the bellows is far drawn out, the use of a step ladder for viewing the image on the focusing screen, and it is in this position that the focusing rod proves itself a great convenience.

(To be continued.)

THE SALTING AND EXCITING OF DRAWING AND OTHER COMMERCIAL PAPERS.

BY MR. LYONEL CLARK.

[Read before the Camera Club, London.]

THE subject on which I have elected to address you this night promises to be no light task; it is a dead horse I have to thrash, an old mummy that I am seeking to revivify. Five-and-twenty years ago this paper would have been useless, for at that date it was the common practice of every worker to prepare his own printing papers. But nowadays the art is lost, and it is the cheapest paper, with the rottenest albumen and the silver reduced to the least possible denominator, that rules the roost. Is this progress? I fear not. Are our prints more permanent thereby? Look at any old collection of prints, the album of the Photographic Club of 1855 for example, and then compare these with your own productions of last year, and let your own conscience give you the answer.

Cutting competition has produced its jerry builders in photography, and it is the cheapest rubbish that finds the readiest sale.

Amateurs may perhaps claim exemption from the charge of niggardliness, but, on the other hand, laziness, or the desire to produce some results at the least possible trouble, has brought about the same failing. The average amateur, who is ready to enthuse over or pay twice as much for his plates if he is assured that they carry their developers on their backs, is not the person who will take the trouble to prepare his printing paper, selecting its quality, surface, and preparation, with the same loving care and thought that a painter spends on preparing his palette or selecting his brushes. For him it is the article that requires the least preparation; "stick it into a printing frame and let it automatically print and tone itself, don't cher know—" that is his motto and ultima Thule of photographic progress.

And yet, surely, the production of our positives is worth a little care; they are the publication, so to speak, of our efforts, and appeal to the whole seeing world. They take us out of the mysteries of the dark-room with its strange jargon and slang, incomprehensible to all save the initiated; they translate our negatives with their reversed lights and shades, like some mystic cryptogram of the old alchemists, into the vivid truthfulness of pictures not yet endowed with the glories of color, but still capable of rivaling in their simple monotone the less true reproductions of the artist in black and white.

In appealing to the members of the Camera Club to revive the beautiful but lost art of silver printing, I believe I may find an audience who really take some pride in their work, and to whom trouble is a pleasure if it only brings success.

And it is only to such workers that my words this evening are addressed,

hoping that the record of my own labors in this direction may help to smooth the little rugosities that they may meet with, and explain failures, to discover the causes of which would take an isolated worker much time. Wisdom, like money, increases by circulation, and it is only by the ready and complete interchange of our individual experiences that we arrive at perfection. There is, I venture to affirm, hardly any great photographic advance whose commencement cannot be traced down to the result of an accident. With these few words of apology—for I shall have more failures to recount than successes to show—I will now commence the practical portion of my paper.

The preparation of paper for the reception of the silver image may be compared, in the power it affords one of shaping its behavior to meet desired ends, to the scientific development of a dry plate, and therefore I am afraid that those photographic ghouls whose chief delight is the collection of intricate formulas will be somewhat disappointed. Quantities of some sort I shall, of course, give, but they are at best but indications of the mean, from which intelligence will guide the way to the best results. When we remember that in a silver print there are at least three elements, each largely influencing the results, which results are again entirely varied by the character of the negative or the quality of the light, it must be at once evident that no hard-and-fast rule can be laid down. I mention these facts to attempt in some way to explain the great discordance that will be seen to exist in the various salting and exciting formulæ that are to be found in our text-books and journals.

Amongst the vast variety of papers, fabrics, and stuffs, I find it almost impossible to point out what can be best used for receiving the photographic image; practically nearly any sort of paper that is made from pure rags will be found suitable, the purer the paper the better the results. The examples I shall show to-night are chiefly on various brands of Whatman's heavy drawing paper, especially that variety known as rough. I have also used several of the hand-made Dutch papers, which are very suitable for some sorts of work. Messrs. Reeves & Son have to-day sent me up samples of Arnold's unbleached drawing papers. I have not as yet been able to try them, but, judging from their appearance and the care exercised in their manufacture, they being quite free from chlorine, and therefore the anti-chlor hypo, I should say that they would be exactly the sort of paper one requires. It is manufactured in three varieties—the rough, not, and H. P.

The salt that is most generally used for printing is undoubtedly the chloride of silver. This salt is usually formed by adding a soluble chloride to a solution of nitrate of silver; chloride of silver is then formed, and a soluble nitrate of the base used is left in the liquid. Now let us form a little chloride of silver, wash it to free it from the soluble nitrates, and expose it to light on a slip of glass. We shall find that it will assume a grayish-blue color with a fair rapidity. If we now treat this discolored salt with hyposulphite of soda, we shall find that it loses nearly all its color, and is all but completely dissolved away. But now let us add a little organic matter, such as beer or gelatine or arrowroot, to the washed chloride and again expose. We shall now find that the substance will darken, but, instead of turning of a purple color, it will now assume a reddish tone, which is, if anything, heightened on the application of hypo, and not in any way destroyed.

(To be continued.)

MERCURY BICHLORIDE IN THE SILVER BATH.

To the Editors of the BULLETIN :

IN reading a question asked by C. A. B. in regard to bichloride of mercury as a clearing of albumen from a positive silver bath, I will give my experience with it, and perhaps it will be of some account to many before they go too far. Every one can take the liberty of giving the thing a trial, as I did some years ago, intentionally, to see what the result would be. I don't now remember how much of a dose I gave the bath. It was a good sized bath, and I gave it plenty enough to "cook it's goose," and it did it. But to all appearances after the paper was sensitized it had the look of perfection, and I began to feel I had obtained something lovely. But after it had come from the fuming closet, mercury never fell so low in a thermometer and in so short a time as it did with me. Yellow was no name for it ! I never tried to print without fuming, but my advice would be, don't fume ; if you do, you may fume worse than I did.

JOHN R. CLEMONS.

OUR ILLUSTRATION.

THE handsome photogravure with which we illustrate this issue of the BULLETIN might well form the theme for a photographic study. The graceful pose of the central figure, the happy contrast of light and shade, the light throwing into prominence the bust and head against the subdued and yet not heavy background, are points of marked beauty in the composition. The birds also give a gentle air to the scene that captivates the eye and adds another element of peace and harmony to a scene that every one with a love of nature will at once appreciate. It is one of those bits of rural life that make one long to run away from the cobble-stones, car-tracks and turmoil of the toiling city.

THE BULLETIN FOR 1890.

WITH the new volume of this journal we shall celebrate the coming of age of the modest little monthly first edited by Mr. H. T. Anthony. In looking over the past twenty volumes of the BULLETIN we feel that our efforts to advance photography have not been put forth in vain. As volume after volume has appeared, there is to be noted a marked improvement, both in the matter of technical execution and in the quality and quantity of photographic information to be found in its pages. There is not another American journal that gives its readers such a large amount of good, useful and interesting photographic information as the BULLETIN, and at such a moderate price. Our constantly increasing subscription list tells us that we have accomplished something in the line of photographic literature which is being appreciated. We believe that we now have the largest circulation of any American photographic periodical. Nevertheless our sphere of usefulness can be greatly enlarged by still further additions to our list of subscribers. Every new subscription makes it possible for us to add some new and useful feature to the journal.

During the past year the pages of the BULLETIN have been enriched by contributions from the pens of some of the best professional and amateur photographers of America. Our German and English correspondents are without rivals in their respective countries, and their letters are copied in many of the English and other European journals. In this particular department we often present to our readers information that they cannot obtain in any other photographic

journal until it has been copied from our pages many weeks after its appearance. We are also constantly receiving photographic information from many remote parts of the world, in the form of notes and letters that appear in the editorial pages.

We have also constantly kept our readers informed of the advances of photography by many valuable translations from foreign photographic journals, another feature of the BULLETIN not attempted on a like scale by any other photographic periodical.

With the facilities for translation which we possess, and with the scientific supervision of these by the editors of the journal, we doubt if there is another photographic journal, American or English, that surpasses us in this particular department.

Yet another important feature of the BULLETIN is the reports of the various photographic societies, which keep our readers posted upon topics under discussion in all parts of the United States and Canada, including the Sandwich Islands and Japan. In this department, also, we are not surpassed by any other photographic journal.

In the matter of illustrations there is not another American journal that gives its readers such a valuable collection of pictures as appears in the twenty-four issues of the BULLETIN. These illustrations it would be impossible to produce and give to the subscribers of the BULLETIN, except for the large facilities that we have for their production and the large number needed for each issue of the journal. These pictures alone are worth more than the subscription price of the BULLETIN to every progressive photographer. They represent the best work of the best professional photographers, as well as that of the most enthusiastic amateurs. In looking back over these illustrations we are proud of them, and sincerely thank our many good friends who have furnished the negatives for the work. We feel honored in being able to present their achievements to the world.

The correspondence department of the BULLETIN still continues to be an interesting and important feature of the journal. These crowded columns from inquiring friends are all *bona fide* letters, and not made up in our editors' room, as is the case in many journals. Usually we have many more of these in the hands of the editors and their staff than can be answered in any single issue of the journal.

Our readers will see how much work and care is used to make the BULLETIN what it has been called, "The leading photographic journal of America." And every effort will be made in the coming year not only to maintain the high standard it has attained, but to raise it to still higher levels of usefulness as a photographic journal. To this end no expense or trouble will be spared. We do not offer any special premiums to induce subscribers to add their names to its lists. We shall give them the best value for their money in the columns of the journal—not in spasmodic efforts, but in a steady flow of useful, interesting and accurate photographic information.

Those who believe in this policy should renew their subscriptions at an early date, and recommend the bulletin to their friends who are not on our subscription list.

If you will help us you may rely upon our continued interest in making the journal an advocate of progressive photography.

THE PUBLISHERS.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.O.S.**
and a corps of practical assistants.

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E. & H. T. ANTHONY & CO., Publishers.

THE ROCHESTER CAMERA CLUB.

The Camera Club, of Rochester, N. Y., begins the year 1890 with a most promising outlook. The old quarters of the Club on East Main Street having proved themselves too small, they have moved into new quarters in the Mansion House Block, corner State and Market streets, where two large rooms have been secured. One of these will be used for both social and business meetings, while the other has been fitted up for a dark room, in which demonstrations will be given.

The latter will, when completed, contain individual lockers, a 15-foot sink with racks, pans, etc., and also an 8x10 Eastman enlarging camera with a pair of 8-inch condensers so arranged that members will have the use of a combined daylight and artificial light enlarging, reducing and copying camera.

At the last meeting, January 9th, the annual election of officers took place, the following being elected: *President*, G. Hanmer Croughton; *First Vice-President*, H. H. Turner; *Second Vice-President*, Samuel H. Lowe; *Treasurer*, Henry W. Mathews; *Sec-*

retary, J. Louis Willard; *Assistant Secretary*, Guilford R. Adams.

The President has since appointed the following committees: *Executive Committee*, H. W. Mathews (Chairman), Ed. W. Horne, Geo. W. Haskins—the *President and Secretary ex-officio*; *Finance Committee*, A. S. Clackner (Chairman), H. H. Turner, W. J. C. Bicknell.

The night of meeting was changed from Thursday to Friday evening. Several other changes in the Constitution and By-Laws, made necessary by changes in the club, were discussed. A committee has been appointed to make arrangements for a reception to be held as soon as the rooms are furnished complete. Demonstrations are held every other week, alternating with a social meeting. Two new members were elected. The Gundlach Optical Company, of our city, has presented the club, for a prize, one of their No. 3 (6 1/2 x 8 1/2) Rapid Rectigraphic Lenses, to be competed for by members, and awarded under certain rules submitted with the lens.

Each member desiring to enter may do so by giving notice to that effect prior to March 1st.

The lens will be awarded for the three best silver prints from negatives made with it; the subjects of these shall be two landscapes and one architectural study, of which one of the first must be made with the back combination used as a single lens. Prize prints must be handed in to the Prize Committee by July 1st. A Committee of award, who shall not be members of the club, shall, as soon after July 1st as practicable, determine which three prints are entitled to the prize. Nearly every member present signified his intention of making an effort for this valuable prize, and the Gundlach Optical Company were granted a unanimous vote of thanks for their kindness. By reference to the following list of those who have so promptly and generously assisted us at this time it will be seen we do not lack for friends:

Hovey Bros.....	\$25 00
Rochester Optical Co. (W. F. Carlton)	25 00
The Eastman Co.....	15 00
Gundlach Optical Co.....	15 00
J. V. Brownell.....	10 00
Bausch & Lomb Optical Co.	10 00
E. E. Bausch & Son.....	5 00
Sargent & Greenleaf, Lock & 30 keys	
Ed. W. Horne.....	Clock
Roch Optical Co.....	Dark Lantern

GUILFORD R. ADAMS,

Assistant Secretary.

THE NEW YORK CAMERA CLUB.

THE first annual meeting of the New York Camera Club was held at the rooms of the club, 314 Fifth avenue, on Wednesday, January 8, 1890. The reports of the different officers were read, and that of the trustees regarding the condition of the club was very gratifying. On suggestion of the trustees, changes were made in certain of the By-Laws; one allowing members of other incorporated photographic societies to become members of the club without paying the initiation fee.

A vote of thanks for the efficient and courteous manner in which he performed the duties of the office was unanimously given to the outgoing President, Mr. W. Townsend Colbron.

On Friday evening, January 10th, Professor Romyn Hitchcock, of the Smithsonian Institution, and formerly a member of the Japanese Imperial Board of education, gave a lecture on Japan, illustrated by the optical lantern, at the rooms of the club. A number of the slides were of scenes never before photographed—in fact, some of the places had never before been visited by a foreigner—and were, therefore, of special interest. The slides were of views of different towns, interiors and exteriors of houses and temples, landscapes, agricultural scenes, gardens and of out-door and in-door incidents in the life of the Japanese people. Several of the slides, depicting scenes of labor in the fields—sowing, tilling and harvesting of various crops—were made by Paymaster H. R. Smith, U. S. N., from his own negatives, and were excellent. All of the slides shown were well made, and those of the temple gardens and of the girls, daughters of high-class parents, who danced at a dinner given to Mr. Hitchcock, were very charming. An audience of ladies and gentlemen, that completely filled the room, was much interested and entertained by Mr. Hitchcock's lecture.

Though the makers of eikonogen warn photographers to beware of ammonia while handling or using the first-named chemical, Dr. H. G. Piffard has proven that ammonia can be used as the alkali with eikonogen, and that it works beautifully. Several of Dr. Piffard's fellow members in the Club are using successfully his formula, which is follows:

Boiling distilled water.....	1 quart.
Sulphite of soda, crystals.....	2 ounces.
Eikonogen, crystals.....	1 ounce.
Bromide of potassium.....	8 grains.

To 1 ounce of the above solution add from 1 to 2 drops of liq. ammonia, the latter amount to be used only in case of decided under-exposure; from 1 to 1½ drops will be

found sufficient for a properly exposed plate. Dr. Piffard says: "Instead of ammonia from ½ to 1 dram of a 1 to 8 solution of carbonate of potassium may be employed. With this latter a little more density can be obtained than with the ammonia. In developing with eikonogen it is well to carry the density considerably beyond the point that we would consider proper with pyro or ferrous-oxalate, as the plate appears to lose more in fixing than with the older developers, and after it is fixed and dried its printing density is not as great as that of a pyro negative of apparently the same strength. Should an eikonogen negative prove too weak it responds very perfectly to the usual mercurial-sulphite intensifier."

H. T. DUFFIELD,
Secretary.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

REGULAR MEETING, JANUARY 7, 1890.

The *Vice President*, J. B. GARDNER, in the chair.

The *Secretary* announced the names of photographic journals and papers received for the section since its last meeting, for which the usual vote of thanks was tendered.

The *Chairman* announced that there would be an informal meeting of the section, Wednesday, January 16th, at eight o'clock P.M., to which all interested in photography were cordially invited. The subject for the regular meeting, February 4th, was not fully decided upon, though it was expected to be an illustrated lecture on "Ancient and Modern Art." The subject for the evening was "Scotland," and would be illustrated with the stereopticon and the pictures described by Professor Randall Spaulding. The speaker was now introduced and occupied the remaining portion of the evening in presenting views of

"SCOTLAND AND THE HEBRIDES."

Several slides were shown, taken from Lady Matheson's park, and presenting bird's-eye views of Stornoway and its harbor. There followed views of Lewis Castle, the peat bogs and stretches of barren moorland in the interior of the islands of Lewis, several crofters' huts, an ancient cromlech at Callernish on the west coast.

The scene was then changed to a beautiful mountain lake, Loch Maree, near the north-west coast of Scotland. The trip was then made through the Caledonian Canal from In-

verness to Oban, illustrated by many views of lochs and landing-places, and especially of the mountain scenery through this great glen of Scotland. Oban, the Charing Cross of the Highlands, with its picturesque location and fine harbor, came next in sight.

The next point of interest was the island of Iona, "Isle of the Blessed," with its quaint village of thatched cottages, its ancient Abbey of St. Mary, St. Martin's Cross, St. Oram's Chapel, etc., all relics of the work of St. Columba.

Staffa, the "Island of Columns," was next visited. Its columnar structure was well displayed, and especially the world-famous Fingall's Cave, the Scottish portal of the Giant's Causeway.

After several views on Loch Katrine and Loch Lomond the scene was changed to Glasgow. Here were seen crowded streets and many public and other buildings decorated on the occasion of the Queen's visit to the Exposition.

A few scenes on shipboard brought the trip to a close.

The lecturer then threw upon the screen some views of New Jersey scenery from the valleys of the Pompton, Passaic, and Rockaway Rivers.

At the close of the entertainment a unanimous vote of thanks was tendered to Professor Spaulding, and on motion the section then adjourned.

INFORMAL MEETING, JANUARY 15, 1890.

THE meeting was conducted under the leadership of *Vice-President* J. B. GARDNER.

The Chairman said: "It has been usually understood that one of the objects of these receptions was to promote a friendly intercourse among those engaged in the same study, and that it was the privilege of all to either ask or answer questions pertaining to the art, to compare methods of working, and so demonstrate the best means of obtaining not only the best results, but the principles or laws on which these results were based. It was suggested at the last informal meeting that perhaps something might be gained by spending a portion of the time in reviewing books and papers specially written for the advancement of photography.

"That these reviews were not likely to be published in any one journal to any great extent, was quite natural to suppose, for they might often clash with some of the main purposes for which a paper or book was written. To such persons only, therefore, as were

present to take part in these discussions, could the full benefit of such criticisms or eulogies be imparted.

"It has been asserted many times by professional photographers that photographic literature was not to be trusted, and hence they felt very little interest in reading or encouraging it. That the opinion of such may be somewhat modified it would be well, perhaps, for those who are habitual readers of this literature to note when they meet with any statement or book either remarkably good or bad, to refer such to the members of the section for approval or censure. It might be well, too, if all photographers were invited to call the attention of the section, or any other photographic club, to such statements in any of the leading photographic journals as in their judgment are misleading or are worthy of the most careful study. Thus the literature of the art might come into greater notice; while at the same time the intrinsic value of the books greatly enhanced, especially if other photographic associations beside the American Institute would devote some portion of their time in thus trying to elevate and make more useful the present and future literature of this art-science.

"There are many photographic books that are now regarded as standard works that might be read and reviewed in photographic clubs that would furnish excellent subjects for discussion, and so increase not only the intelligence of the disputants, but greatly add to the merits of the author and to a higher appreciation of his work.

"If the chief motive in engaging in such reviews were simply to learn the truth and to elevate the standard of photographic literature, authors as well as practical photographers would gladly attend such societies, and take part in their debates.

"How these reviews could be made the most effective might be very different in different societies. In this regard each must judge for itself."

After some little debate concerning the feasibility of introducing book reviews, the subject was changed to the toning of aristotype paper, and to the salting, printing and toning of plain paper.

Mr. CORNELIUS VAN BRUNT said: "I have had good success in toning aristotype paper with a solution containing 8 ounces of hyposulphite of soda dissolved in 30 ounces of water, and to this is added 15 grains of chloride of gold dissolved in 1 ounce of water. To the above compound is added 75 grains of nitrate

of lead and 2 ounces of a saturated solution of alum."

Mr. P. C. DUCHOCHOIS said: "From a chemical standpoint I should take exceptions to such an incongruous compound, and though the aristotype paper can be toned in this way, as has been demonstrated by Mr. Van Brunt, I believe it can be toned equally well with a more simple formula."

He then rehearsed the chemical changes that took place in mixing the ingredients as above named, and thus substantiated his reasons for his belief.

The preparation of plain paper was next discussed, and from the experience of those that took part in the debate it was demonstrated that in the salting of the paper from 3 to 15 grains of a chloride, with from a quarter to 3 grains of gelatine in each ounce of water, could be used for immersing the paper. Such paper could be floated on a bath containing 40 grains of nitrate of silver and 3 drops aqua ammonia in each ounce of water, being careful to dissolve nine-tenths of the oxide of silver with C. P. nitric acid, thus leaving the solution slightly alkaline.

Another method recommended was to take a 40-grain silver solution, and to one-third of this add aqua ammonia until the oxide thus formed was dissolved; add this to the two-thirds portion of solution and redissolve the oxide with C. P. nitric acid. "This bath," Mr. Gardner said, "gives the most vigorous contracts when slightly alkaline, and hence is best for flat or weak negatives. With this bath the paper may be silvered with a brush or swab suitable for the purpose."

The toning and fixing may be done in a single solution containing 1 ounce of hyposulphite of soda dissolved in 6 ounces of water. To every 6 ounces of this (solution) is added 1 grain of chloride of gold and 3 grains of chloride of silver. With this bath no previous washing of the prints is required, but are immersed as taken from the printing frames. When sufficiently toned they are transferred to a bath containing 60 grains of salt in each ounce of water, where they may remain from five to eight minutes if darkly printed."

Mr. DUCHOCHOIS said: "I can corroborate what Mr. Gardner has stated by my own experience, though we differ somewhat in some of the unessential details of the process. And now I should like to say, dropping the further discussion of plain paper manipulation, that a bath I have found very excellent for albumen paper is made by dissolving in the proportion

of 1 ounce of silver nitrate to 4 of water and precipitating the silver with caustic potash, and after washing the deposit, redissolve it with a saturated solution of nitrate of ammonia, and add sufficient water to make 12 ounces of solution. With this bath the paper is quickly sensitized, and is afterwards treated in the same way as paper silvered with the baths in common use. That this bath is better than many I am familiar with I am perfectly convinced or I should not take the trouble to speak of it here."

The hour for closing having arrived without further debate the Chairman declared the session adjourned.

THE NEWARK CAMERA CLUB.

Mr. EDWARD WESTON delivered an interesting address before the Newark Camera Club, January 13th, on the use of the new developing substance, eikonogen.

Mr. Weston said that in August last he began a series of experiments with this substance, and that eikonogen in general behaved very much like the other two developing agents, pyro and hydroquinone, but that in many respects it possessed some advantages over either of them. He said he had tried it in combination with all alkalies and carbonates, and some other salts of the alkalies, and found that with the exception of ammonia they all gave excellent results when properly combined with eikonogen. It was his opinion that eikonogen is more generally useful than any of the other developing agents heretofore brought to the attention of photographers. The speaker added that it may be said to be a universal developer, since it is capable of being used for the development of negatives and bromide prints, and gives magnificent results when used as a developer for lantern slides. He said that there was no difficulty in getting any desired density of image, and that for instantaneous pictures, even when taken under conditions which were extremely unfavorable, and from which it would be almost impossible to make good pictures with any other developing agent, this substance will still yield excellent pictures.

The speaker pronounced eikonogen to be the most powerful developing agent brought to the attention of photographers, and predicted an extensive use of it as its good qualities became better known. He gave this rule for its use: When eikonogen is substituted, the amount of eikonogen in the developer should be about three times the amount of

pyro commonly used. This for all purposes was a perfectly safe rule to follow. For ordinary exposures the amount of preservative might be varied very greatly without effecting any change in the image, but for very prolonged development in cases of extremely short exposure, and with very poor light, he recommended a somewhat liberal use of the preservative commonly used, namely, sulphite of soda. Eikonogen, he said, yields brilliant negatives and shows less disposition to fog the plate than other developers, and, if properly used, never produces a stain, even when the development has to be very greatly prolonged.

Mr. Western exhibited several negatives from instantaneous exposures with the highest speed shutters and on plates of medium sensitiveness similar to the Carbutt or Seeds No. 23. They showed exquisite detail and many of them were of great density.

BROOKLYN INSTITUTE—PHOTOGRAPHIC DEPARTMENT.

A PLEASANT meeting of the Department of Photography at the Brooklyn Institute was held January 14th, in the upper hall of the Washington street building. A resolution offered by Professor Peckham, and adopted, forms the chairmen of the various department committees in an Executive Committee, having power to conduct the business of the department, and particularly to arrange the programmes for the meetings. Professor Peckham exhibited an ingenious device of his own making for "fixing" negatives in a deep instead of a shallow tray. Mr. Edmund Blunt was appointed Chairman of the Committee on Appliances and Processes, and Mr. F. A. Hetherington was appointed Chairman of the Art Committee.

Mr. Wallace G. Levison was to have read "Notes on Pyrotechnical Photography," but in consequence of his illness the paper was postponed until the next meeting on the second Tuesday in February.

An interesting lantern exhibition was substituted for Mr. Levison's paper. Professor Peckham displayed and commented upon an attractive series of slides, illustrating curious and picturesque geological formations. Many of these views were of great beauty. President Black then exhibited a selection of lantern pictures from his lecture, "Life Through a Detective Camera." A large number of new members have been received by the department.

LYNN CAMERA CLUB.

THE club met January 10th for the first time in its new quarters, and a description of them will be of interest.

The building is located at No. 42 Broad street. It is 30 x 40, two stories high, with flat roof, having a raised roof in front. The entrance is directly in the centre of the building, and has a large, well-lighted front entry, from windows at the side and over the door. On the window over the door is the number 42, in large gilt figures. Upon ascending an easy flight of stairs, you find yourself in a large, well-lighted room, occupying three-fourths of the upper floor.

The main room is 40 feet wide in front and 15 in the rear, being 30 feet long. The dark room takes up the other part of the upper floor, and is 15 x 20 feet.

The main room, which is to be used for the meetings of the club and the exhibition of lantern slides, is the most admirably adapted for the purpose in the country. The most conspicuous thing in the room is the large open fireplace.

It cuts off the corner made by the dark room and occupies about the center of the room. It is about 6 feet wide with an opening of about 5 feet. A large pair of old-fashioned andirons occupy the hearth, which were a present from one of the members of the club, Herman Lemp.

They were made by Mr. Lemp, and all of the joints were welded together by electricity. The upright part imitates bamboo, and consists of seven pieces of wrought-iron welded together by electricity. Each of the andirons weighs 31 pounds.

The fireplace was the gift of one of the members, Mr. J. N. Smith.

At the lower end of the room is a large 10-foot screen for the use of the stereopticon exhibitions. The room has a large 8-foot square side and roof window which gives the best of light.

The room is lighted by gas and electricity, all of the electric wiring being the gift of Professor Elihu Thomson, a member of the club.

Hung upon the walls are several very fine pictures, one being the gift of W. B. Gifford, which shows some of his work.

The other two are from the camera of E. F. Bachelder, one of these being a bromide enlarged view on Mount Worcester, Lake Sunapee, N. H.

The brass fixtures are from the well known house of R. Hollings & Co., Boston. George

D. Bancroft did all of the electrical work in a first-class manner. Arthur B. Curtis presented the club with a very fine revolving chair. The dark room, which is directly off from the main room, is 15 x 20, and is connected by valve doors.

There is a 12-foot sink having five faucets in it, and all the other necessary conveniences.

Thirty-six lockers are placed around the room for the use of the members.

A window is in the rear of the room, which is to be specially arranged for reducing camera work.

All of the lights in the room are controlled from the outside. On the first floor is a large billiard room, 20 x 35, which is soon to be fitted up for the use of the members.

This most admirable building has been built by Mr. N. J. Bacheller.

Electric call bells and speaking tubes connect the building with Mr. E. F. Bachelder's office, a short distance in front of the club's building.

The Entertainment Committee, consisting of W. B. Gifford, Dr. E. Williams and W. A. Porter, together with the Executive Committee, which consists of all of the officers of the club, have charge of the dedicatory exercises which are to be held on Thursday evening, January 23d. A spread is to be given in connection with other exercises. There were three new members voted in, Frank W. Keene, W. Gerry Keene and Einar Rosmussen.

The club is in a very flourishing condition at present, having forty-two members. They are connected with the N. E. Lantern slide Exchange, and every three weeks throughout this winter they will receive a set of new slides which will be then shown.

The club has just received its act of incorporation from the State, which was granted December 20, 1889, and is now framed and hangs upon the wall of the main room.

ST. LOUIS CAMERA CLUB.

ST. LOUIS, December 3, 1889.

THE regular meeting of the St. Louis Camera Club was called to order at 8.40 P.M., *President BAIN* in the chair.

The Membership Committee recommended the election of the following named gentlemen: Messrs. Ed. V. Boissonnas, Lon Sanders, J. W. Birkner, C. L. Babcock, Arnold Kuhlo, and after balloting, were declared unanimously elected. Upon being called upon by the President for a report, Mr. H. B. ALEXANDER,

Chairman of the Lantern Slide Committee said: "I received a letter from Mr. Beach, who had charge of sending out the slides of the interchange, and his only statement in the letter as to the cause of the delay in our getting slides was that he had been elected Secretary of the New York Camera Club, and did not have time to get the slides out. Since then we have received our slides that had been rejected, with the New Orleans slides, which will be exhibited this evening.

Mr. MELCHER, chairman of the House Committee, stated that the dark room would be ready for use by the members in about a week, and that it was all ready except the chemicals, and that the furnace for heating the building would be ready in a few days, so that the dark room could be heated in very little time.

Mr. Dunn explained the making of lantern slides for the information of the members.

Mr. Dunn said: "My way of making lantern slides is by reducing or photographing the negative. I have a window about 14 inches square, in which I have a piece of ground glass. Inside of the window, about 3 inches from the ground glass, I have a frame which holds the negative. On the outside of the window I have a board painted white, slanting at an angle of 45 degrees, for reflecting the light. I have a board coming in the window, on which I place my camera. I simply take a photograph of the negative. I have the room all dark except what light comes through negative and ground glass. I photograph the negative and develop according to the formula which is given in all of Carbutt's lantern slide plate boxes, which is called the iron developer. It would be much easier for me to show any member how to make a slide than to explain how. Any one who can develop a negative can make a lantern slide. Simply photograph the negative and develop the same as a plate.

Another way of making lantern slides is by contact. Place the plate in contact with the negative in a printing frame, the same as in printing, only having a plate instead of paper, and expose to the light and then develop it.

President BAIN—Can you give the members any idea as to time to make exposure?

Mr. DUNN—It would depend upon the amount of light they had, the density of the negative, and the sensitometer number of plate used. I use No. 10 Carbutt Plate when I can get it, and let it have about one minute's exposure for ordinary negative without sunlight shining on it. The window faces north and I

have strong light. It is pretty hard to say how much time to give. One has to judge from the negative.

President BAIN—Have you ever used hydroquinone in developing?

Mr. DUNN—I have, but I cannot get warm tones with hydroquinone. I get several tones with iron by using old developer or using more or less bromide of potassium as a restrainer.

President BAIN—Suppose you wanted brown tone?

Mr. DUNN—It is often made by intensifying the lantern slide.

President BAIN—What method of intensifying do you use?

Mr. DUNN—I use, say 60 grains of bichloride of mercury, the same amount of bromide of potassium, and 12 ounces of water. Then darken the slide with sulphite of soda.

President BAIN—Have you any particular proportion of sulphite?

Mr. DUNN—I generally take a teaspoonful of sulphite and dissolve in a half glass of water.

President BAIN—Do you find that chrome alum has anything to do with the tone of the lantern slide?

Mr. DUNN—Very often I do not use alum.

PRESIDENT BAIN—Have you ever attempted to fix a slide that had been developed with iron or hydroquinone in the same fixing bath that you fixed pyro developed negatives?

Mr. DUNN—I always have a separate bath. I think if you attempted it you would spoil the sky of the slide. There would be pyro to a certain extent in the fixing bath.

When parts of negatives are very dense I use a sheet of paper with a hole cut in it, and by moving it in front of negative I can give certain parts of the positive more time than the other parts.

Mr. H. B. ALEXANDER—In this connection I would like to say I received a personal letter from Mr. Morse, Secretary of the Chicago Lantern Slide Club, saying that the St. Louis slides had been exhibited there and that they were very highly praised, and a number of the members asked Mr. Morse to inquire of Mr. Dunn what lens he used in taking the Colorado views and also what developer he uses?

Mr. DUNN—I have a Hermagis No. 7, and a small Steinheil lens. I develop the negatives with pyro and soda, and the lantern slides with the regular Carbutt developer. The tones are obtained by using old developer and by giving them plenty of time. I think,

although I am not certain, that the old developer will give richer tones than fresh developer. The Steinheil lens I have is a short focus lens and could be called a wide-angle. It is about 6 inches focus.

On motion of Mr. Holman a vote of thanks was tendered Mr. Hyatt for presenting some apparatus to the club for use in the dark room.

Mr. Seth C. Jones, of the Eastman Dry Plate and Film Company, exhibited a new three-and-a-half inch "Kodak," also a number of different styles of camera levels.

Numerous visitors were present.

On motion adjourned.

After the meeting one hundred and fifteen (115) lantern slides, including those of the New Orleans Club, were exhibited.

GEORGE B. COMPTON,
Secretary.

CASE SCHOOL CAMERA CLUB.

At a meeting of the club, held Friday afternoon, January 10th, *Secretary WILLIAMS* and *Vice-President MARSHALL* gave an interesting and instructive demonstration of the solarization of plates through a long exposure.

They exposed for one hour and thirty-five minutes a Seed plate, No. 23, on a subject, and with a stop so large that the correct exposure would be a fraction of a second.

The plate was developed with an eikonogen developer made by taking 80 c.c. of the eikonogen solution to 20 c.c. of the sodic carbonate solution and adding an equal amount of water. The ordinary developer is about 75 c.c. No. 1 to 25 c.c. No. 2 and no water. To the developer was added a few drops of nuktigonia and development carried on under gaslight. The result was a *positive* somewhat over-developed.

MILTON B. PUNNETT,
Corresponding Secretary.

BOSTON CAMERA CLUB.

The annual meeting of the club was held at the rooms, Monday evening, January 6th.

The following officers for 1890 were elected: *President*, Henry N. Sweet; *Vice-President*, Francis Blake; *Secretary*, Edward F. Wilder; *Treasurer*, William Garrison Reed; *Librarian*, John C. Lee; *Executive Committee*, F. Alcott Pratt, C. E. Davis, Jr., S. Henry Hooper.

The resignations of ten members were read and accepted and the vacancies immediately filled from the waiting list by the election of the following: David W. Lewis, Adolf. Lomb,

J. M. Bassett, Thomas W. Babcock, Edmund B. Garfield, Sylvester Baxter, A. Lincoln Filene, R. S. Stearns, O. A. Eames.

The Treasurer's report showed a gratifying state of the finances of the club, and upon his recommendation it was voted to pay the remainder of the club's floating debt from the income of the current year.

In response to an invitation from a committee in charge of the matter an informal exhibition of the work of members was displayed upon the walls.

Although not quite as extensive as the exhibition of a year ago it was very creditable and contained much that was fine. A large proportion of bromides was noticeable, some contact prints by this process by C. E. Hubbard being noticeable for softness yet full of detail.

The prize (a year's subscription to a photographic journal), was awarded by ballot to John C. Lee, for his study of a "Boy with Violin." Next in order of merit was Mr. Frizzel's "Village Blacksmith," in bromide, and Mr. Mean's "Unloading Seaweed," in albumen silver.

At the close of the meeting the company partook of a collation which the Committee on Entertainment had provided in the studio.

E. F. WILDER,
Secretary.

WE would not do without the BULLETIN for \$10 a month. We think it is the best photographic reading we have ever seen. We believe every live photographer should have it. It is the best journal published.

CRABTREE BROS.

I HAVE learned to take great pleasure in the visits of the BULLETIN. It proves a great help to me. Wishing you success in the future.

J. T. BARNES.

Bibliography.

THE YEAR BOOK OF PHOTOGRAPHY FOR 1890.

THIS well-known English annual comes to our table again with its numerous items of interest. In addition to the usual tables, calendar and formulas, we have articles from about eighty prominent writers that occupy about one hundred and thirty pages, and about thirty-four pages of jottings culled from the journals during the past year. The illustrations consist of a Woodburytype print by Waterlow & Sons, of London, which is very

good indeed, and a portrait of Edmund Becquerel, which we think a rather poor example of typographic printing after Meisenbach's principle.

THE FORTH BRIDGE.—A reading to accompany a set of lantern slides. By G. W. Wilson, Aberdeen, Scotland.

Those of our readers who are interested in this marvelous piece of modern engineering should get this pamphlet, and those who have lanterns will find the slides interesting. The pamphlet is full of statistics carefully selected, and is well worth reading.

PHOTOGRAPHIC TIMES CALENDAR.—This handsome register of the flight of time again adorns our sanctum, and we tender Mr. W. I. Lincoln Adams our sincere thanks for his kind remembrance.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—C. S. S. writes: Has Colonel Pennington ever given the mode of making two or three portraits of the same person in different positions on the same plate, like his picture "Playing Chess with Himself and Looking On," as illustrated in the BULLETIN, May, 1887? Also, will you answer the following conundrum: Suppose that an order for cabinets is given, and a sitting is made on the 24th of the month, the proofs being sent on the 26th, and none returned until the 2d of the next month—in the meantime the studio is sold, with possession on the 1st, the purchaser to have all orders then unfilled; whose order is the one mentioned, the buyer or the seller of the studio?

A.—Colonel Pennington has not published any explanation of his method of working up to the present time. In regard to the second question the answer appears evident; the order is unfilled (not completed), hence the buyer owns it.

Q.—A. S. writes: Will you kindly inform me how the polish on the illustration on N. P. A., in the BULLETIN for December 14th last, was obtained?

A.—Write to Mr. O. P. Scott, 2220 Indiana avenue, Chicago; he made and finished the pictures, we believe. We think it can be ob-

tained with any good burnisher that is properly managed.

Q.—I. S. writes: Will you kindly inform me through the BULLETIN which is the best magnesium flash-light and the safest? Also, what would you recommend me to use in taking a group in a parlor in the way of flash-light (or in town halls), and also what kind of a lens and stop? I have an 8 x 10 rapid rectilinear, also 8 x 10 wide angle and portrait tubes.

A.—We have had excellent success with the Mize flash-lamp in groups of six or eight persons, using a $6\frac{1}{2} \times 8\frac{1}{2}$ R. R. lens. For larger groups and assemblies we should recommend the distribution of the light according to the size of the room or hall. By using a series of rubber tubes and connections several lamps can be flashed at once. Read the "Letter from Germany" in this issue of the BULLETIN. Use a larger stop than would be required in dull daylight.

Q.—W. M. writes: By following one of those carelessly prepared formulas, too often found in photographic publications, I have lost about 3 ounces of silver nitrate in making a silver printing bath. The formula is found in the "Year Book of Photography," 1887, page 179, and also in the "Year Book" for 1888. Of course, I got too much citric acid in my bath. I then neutralized it with ammonia, and filtered it, with most unsatisfactory results. Have also tried it slightly acid, and also alkaline, and fumed the paper. Its strength is now 48 grains to the ounce. How can I make this bath workable? Will evaporation help it?

A.—We think that the only safe way out of your trouble is to evaporate the bath and ignite

or burn the residue. Then dissolve in chemically pure nitric acid, evaporate off the excess and make up to original strength of bath.

Views Caught with the Drop Shutter.

MR. HENRY G. THOMPSON, formerly of the firm of Douglass, Thompson & Co., later with N. C. Thayer & Co., of Chicago, and for the last few years manager of the Blair Camera Co., Chicago, is anxious to become associated with a good business man to start an amateur photographic supply company in Chicago, or would accept a position with any well-established photographic supply house in the west.

We take pleasure in noting the marriage of Mr. Albert D. Gatchel, of Louisville, Ky., to Miss Daisy Caroline Letitia Forwood, of the same city. The happy event took place January 7th last, at Warren Memorial Church, Louisville. We wish Mr. Gatchel and his bride a long and happy life together.

GUTEKUNST, the well-known photographer of Philadelphia, is also one of the best photo-mechanical printers in America, and we are very much pleased to receive from him an artistically bound album of specimens of his work. They are certainly very beautiful, and we tender our best thanks for them.

WILLIAM H. RAU, of Chestnut street, Philadelphia, sends us a catalogue of lantern slides made by him. Those in need of slides to illustrate lectures should send for this very complete collection.

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THE DAGUERRE MONUMENT
to be erected at Washington, D. C. by
The Photographic Association of America

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

FEBRUARY 8, 1890.

Vol. XXI.—No. 3.

SYSTEMATIC WORK FOR PHOTOGRAPHIC SOCIETIES.

WHEN we note the number of photographic societies that are to be found throughout the United States we are led to ask the question: What particular purpose does each one serve? That the members are lovers of photography, goes without saying. That each one is a member of the society he or she belongs to for the purpose of acquiring skill in the use of photographic apparatus may also be taken for granted. And yet there are quite a number of members who, after going a certain distance in this process of education by association, ultimately exhibit a lack of interest in the art, and may possibly fall out of the ranks. To overcome this tendency to lose interest in photographic societies, some organized effort at systematic work among the members appears eminently desirable.

Mr. W. Jerome Harrison, the Vice-President of the Birmingham Photographic Society in England, has just issued a pamphlet which contains a report of his address before the above society on a proposed photographic survey of Warwickshire. In reading this address we are forcibly impressed with a number of his suggestions and their applicability to the photographic societies of the United States.

Mr. Harrison proposes that Warwickshire shall be photographed in a systematic manner, and that these records obtained with the camera shall be preserved as contributions to the history of the county. To make such work valuable it must be done under the direction of a committee organized for the purpose, and not left to the caprice or whims of any one individual. The members must submit to the orders and suggestions of such committee, for it is a well-known fact that organized effort is of infinitely more value than spasmodic work of individuals without regard to the actions of others.

Work of this kind organized under the auspices of various local photographic societies would become exceedingly interesting to the members themselves, and indirectly would be encouraged by the people at large. In every county in every State, at least in the older ones, there are maps sufficiently accurate to form a basis for laying out the territory to be surveyed, while the county records, local histories, old newspapers and journals would furnish material for papers and lectures that would fill up the time of every working member of the photo-

graphic society for some years. But, somebody suggests, this is going to be expensive, and our societies are many of them not rich. True, but we do not mean that they shall spend any more money than at present, only that they shall use it to some definite purpose; use it to add something to the interest of the locality in which they live, and something that shall make them worthy of the name they bear—amateur photographers.

Assuming that money will be necessary to make their work more valuable, we are sure that in each county in most of our States there are a sufficient number of people with local pride that would be willing to subscribe to defray the extra expenses incurred in carrying out the survey. But it must be distinctly understood that every dollar so subscribed shall be used in publishing the records, and not for making the negatives or paying the expenses of the members who obtain them. As soon as a society or any of its members enters into any money-making arrangements with outsiders, and which are to return a profit to the society or any individual thereof, such a society is no longer an amateur organization. But we see no reason why any extra expense, incurred in work that is of special benefit to those not members of the society, should not be paid for at cost of material used. If this ruling was carried out, the bad feeling that appears between amateur and professional photographers in some localities would cease to exist. For, assuming that some local survey is in progress, and that outsiders desire copies of the work of members of the photographic society, an arrangement could readily be made with some local professional photographer by which prints could be made and sold by him without regard to the cost, but at such price as his judgment would lead him to believe would be profitable. Under these circumstances there should be harmony. But as soon as the amateurs begin to enter into business relations with people outside the society they trespass upon ground that they, as amateurs, should not occupy, and, what is equally disagreeable, they encourage the criticism of those who are not their friends and enjoy any excuse to malign them.

A local society having decided to take up some systematic work of the character indicated above, the first thing to do is to lay out the territory on the map so that each member willing to undertake the work shall have an equal share of the ground to be covered. And right here a number of Mr. Harrison's suggestions in regard to the photographic survey of Warwickshire are equally well worth considering in the United States. The first suggestion is to utilize the various outings or excursions of the society, so that the members may do something definite and worthy, instead of working in crowds and "getting into and out of one another's way." The outing should be organized and the work divided up, so that at most four only should be working in a given position. Yet another suggestion is to hunt up all negatives of the county already made and determine their value and the desirability of making new ones of the same subjects. The work of local scientific, historical and other societies could also be used and their members interested in the work. The archæologist, the naturalist, the botanist, the mineralogist, the ornithologist, the geologist, indeed every observer of nature and her work would certainly lend a helping hand in this work.

Many good and useful directions in which photography could be made extremely interesting to the inhabitants of any county will suggest themselves to those who will but take hold of the work. Our space forbids us to enlarge upon this idea; but we hope that the suggestions started by Mr. Harrison will bear

good fruit, and that he will have the pleasure of hearing that here also, as well as in England, his timely words are giving us such a rich harvest of results that photography will be ever grateful to him.

Now, officers of photographic societies, organize for the work at once, and as soon as spring opens, to the field with your members and their cameras.

EDITORIAL NOTES.

Dr. H. CARRINGTON BOLTON, who has recently returned from a trip through the Sinai Peninsula, will give an address before the New York Camera Club on the evening of February 10th, and from our knowledge of the gentleman and his work, we promise the members a good evening's entertainment. Dr. Bolton is a scientific traveler and an excellent speaker. Those of our readers who can obtain tickets should attend, and note the results of using the celluloid films from which the lantern slides were made to illustrate the lecture.

Mr. S. R. STODDARD, of Glens Falls, N. Y., sends us a handsome 5 x 8 print of the Statue of Liberty in New York Bay. This picture is particularly interesting from the fact that it was taken by the magnesium flash light at night, and is a remarkably fine piece of work of such a subject. It is certainly one of the best pictures of the kind we have seen, and we congratulate Mr. Stoddard upon his success.

WE had the pleasure of receiving from Dr. H. W. Vogel, the three handsome silver medals awarded to American exhibitors at the Berlin Jubilee Exhibition last summer. These medals had a head of Daguerre in relief on one side, and on the other the name of the exhibition and the exhibitor's name. The recipients of the medals were Professor H. A. Rowland, of Johns Hopkins University; Professor W. H. Pickering, of Harvard Observatory, and W. H. Jackson, of Denver, Colorado.

OUR attention has been called to the fact that in our review of the photographic exhibit at the American Institute Fair we credited Mr. F. Gutekunst, of Philadelphia, with receiving a bronze medal. This is a mistake; the medal was a silver one, for taste, and he well deserved it. We are glad of the opportunity of correcting the mistake, as the medal was the only one of the kind in that department.

WE are indebted to the Executive Committee of the Lynn Camera Club for an invitation to the dedication of their new club house on January 23d last. We regret very much our inability to be present. Accompanying the invitation is a little souvenir celluloid positive picture of the club house, which is very neatly done, and shows the handsome quarters of this enterprising society.

At the December meeting of the Columbus Camera Club a committee was appointed to look for larger and more convenient quarters, and as a result of its work the members now find themselves comfortably situated in Room No. 10 of the Dunn Building, where all visiting members of other clubs are welcome. In the main room they have a large skylight and four side windows that answer well for portraiture, and the dark room is large and well ventilated. The annual

election of officers resulted as follows: *President*, F. H. HOWE; *Vice-President*, J. N. Bradford; *Treasurer*, J. C. Hull; *Secretary*, G. Y. Anderson. Five new members have been added to the roll in the last month, and the club is in a most flourishing condition.

THE Pacific Coast Amateur Photographic Association of San Francisco has recently completed an illustrated lecture with the title, "Glimpses of California," for circulation among amateur photographic societies, especially those that are engaged in a similar work respecting their own localities. The Eastern circuit is in the hands of the Boston Camera Club, and any society that desires to use the lectures and slides in entertaining its friends may apply to William Garrison Reed, 25 Kilby street, Boston, Mass. Two years ago the Boston Camera Club withdrew from the American Lantern Slide Interchange, desiring to concentrate the efforts of its working members upon "Illustrated Descriptions" of cities or localities. In February, 1889, "Boston" was given to the public, and ever since then two complete sets (one in England and one in the United States) have been in active circulation among the amateur photographic societies. The reception accorded to "Boston" encouraged the members to undertake another subject, and for several months have been engaged in preparing "A Tour of the White Mountains." It will be ready to start on its travels by the 1st of March, and will be freely loaned to any amateur photographic society desiring to give a public entertainment. Applications should be addressed to Mr. Reed, at the above address.

MESSRS. W. V. RANGER and H. McMICHAEL called upon us on their return from the meeting of the Executive Committee of the Photographers' Association of America, held in Washington, to make arrangements for the coming Convention there. They state that the meeting will be held August 12th to 16th next.

Mr. H. McMICHAEL has been elected treasurer of the committees on the Daguerre monument, and gave us a list of the members of local committees in the principal cities. These appear on another page.

THE Marlboro (Mass.) Camera Club held a meeting on Tuesday, January 14th, and elected the following officers: *President*, H. C. Russell; *Vice-President*, C. M. Howe; *Treasurer*, O. H. Stevens; *Librarian*, J. F. J. Otterson; *Secretary*, George L. Stevens.

WE are indebted to the Committee of the Detroit Amateur Photographic Society for an invitation to the opening of their new club rooms, 42 State street. The invitation and programme are very artistic and embellished with an excellent photo-mechanical print. We regret that time and distance prevented our being present at the interesting meeting of January 14th, an account of which will be found on another page.

ENGLISH NOTES.

THOSE who have occasion to dry plates rapidly should try the sulphuric acid plan. Wipe the back of the plate dry with a cloth; remove the surface moisture

off the front by pressing it upon two or three thicknesses of blotting-paper. Now half-fill a dish (the larger the better) with strong sulphuric acid, and place the dish and the plate or plates to be dried side by side in a shallow box, which should be as nearly air-tight as possible. The box used for fuming paper with ammonia ought to answer very well for this purpose. Sulphuric acid greedily absorbs moisture, and hence it soon dries the air in the box; and in its turn the dry air abstracts the moisture from the gelatine plate. Of course, the acid must not come into contact with the plate, or indelible markings will be produced. The acid may be used over and over again, until it becomes twice its original bulk.

In the dull weather which we are now experiencing, it is often necessary to keep sensitized paper in the printing-frames for two or more days before a satisfactory print can be obtained. Under these conditions the paper yellows; and in the subsequent toning such yellowed paper does not yield good results. But if the fresh paper, when placed in the printing-frame, be "backed" with a piece of old sensitized paper—or by using any old untuned print which may be lying about—this yellowing will be prevented and good tones can be obtained. A further useful precaution is to back the paper in the printing-frame with a piece of sheet India-rubber. This rubber backing is indispensable in the platinotype (hot-bath) process, in which the least access of damp to the prepared paper is fatal to a perfect print, but it is also advantageous in use with ordinary albumenized paper.

Additions to our list of developers proper have of late been numerous and important; hydrokinone, eikonogen, and other substances have placed new powers in the hands of the photographer. I won't say that I am greatly pleased with eikonogen. It is now sold in the form of whitish crystals, which turn brown—in my samples at all events—when kept for a few weeks. The following developer I find so good that I had some thought of keeping it as a "trade secret" (!); but better thoughts have prevailed, and I give it here for the benefit of the readers of the BULLETIN.

SOLUTION A.

Eikonogen.....	100 grains.
Sodium sulphite (sulphite of soda).....	500 "
Boiled distilled water.....	4,000 "

SOLUTION B.

Sodium carbonate (crystals).....	1 ounce.
Potassium carbonate... ..	1 "
Yellow prussiate of potash.....	1 "
Boiled distilled water.....	10 ounces.

To develop (say) a quarter-plate, take 1 ounce of solution A, and add to it 1 ounce of distilled water. To this add twenty drops of solution B, and pour upon the plate. If no image appears after two minutes, add more of solution B, a few drops at intervals of two or three minutes. This method of slow, gradual, or tentative development, is now adopted by all our best workers, for exposures as to which they feel any uncertainty. Of course, for studio work where the exposure can be gauged to a fraction of a second, and where the work must be got through quickly, it is not necessary.

In making up any developer it is best to use distilled water, and to boil this distilled water in a glass flask for a quarter of an hour to expel all the dissolved

air which even such water contains. While this water is still warm (but not hot) dissolve in it the sulphite of soda, the crystals of which ought to be clear and bright, and which may with advantage receive a prior rinsing in water to remove any crust of white powdery sulphate which may have been formed upon them. Lastly, add to the still warm water the eikonogen, etc. Eikonogen is not very soluble in plain water, but it is much more so in water in which sulphite of soda has just been dissolved. The developer made up as described above requires no restrainer in ordinary cases. Where extreme over-exposure is suspected a few drops of a 10 per cent. solution of potassium bromide may be added. This developer remains very clear, and may be used over and over again. It is excellent alike for negative work and for the development of bromide-paper, lantern-slides, etc. The picture may be allowed to gain rather more apparent density than with pyro, and the density should be judged by transmitted light (holding up the plate or paper between the eyes and the lantern) rather than by reflected light.

I am experimenting with a new substance as an accelerator—hypophosphite of soda, to be used instead of ammonia, the carbonates of soda or potash, etc. I find that this substance is able to do very good work, and I shall describe the results obtained in another letter, when I have had more experience with it. In the meantime perhaps some readers of the BULLETIN will test its powers.

English professionals usually place a pretty picture on an easel, or hold an attractive carte or cabinet in their hand as an object upon which the sitter's eye may be directed when a portrait is being taken. This plan is good; but for an amateur who is desirous of taking his (or her) own portrait, I recommend the "looking-glass method," in which a mirror is placed in the line of the eyes (but out of the picture, of course), so that the expression can be studied and maintained. The word can then be given or a sign made to a friend to uncap the lens, or if a long pneumatic tube is employed the exposure can be made by the sitter personally. Actors and actresses know how to put on desired expressions at will; but ordinary individuals find the use of a glass mirror a great assistance in "composing the face," and assuming and maintaining the expression which they desire to have depicted.

Among the many uses of celluloid in photography Mr. Jerome Harrison has recently drawn attention to its applicability for lantern slide making. Testing some thick celluloid films purposely coated with a slow emulsion, I have made lantern slides which are practically equal to those upon glass. The films may be placed between a pair of clear glass plates for exposure in the lantern, or they can be used in a thin metal carrier, or even in a simple metal groove. If such slides are passed through the lantern at the ordinary rate, there is no fear of their "buckling" or undergoing any change; but if a single celluloid slide be kept in a hot lantern for ten or fifteen minutes it might be affected in this way. The remedy, however, is simple; it is to place a thin glass tank filled with alum-water between the condenser and the slide. The alum-water arrests—filters out as it were—most of the heat-rays, leaving the light-rays to pass on and do their work. In my future lecturing trips to distant parts I shall carry celluloid slides instead of glass; and their lightness and the absence of fear as to breakages will be of great advantage. The ideal lecturer's outfit of the near future will, I believe, consist of long strips of celluloid, on which will be printed, in due order, all the illustrations necessary for his lecture; each lecture set on a separate roll. A roll

holder will be adapted to the front of the lantern, and the pictures will be reeled off from one end to the other, without the possibility of a mistake as to their order of succession, or the chance of any examples of "upsidedownness" occurring. When he thinks of his mishaps in these respects in the past, and of the happy immunity of lecturers in the future, the wish that he had been born later occurs to

TALBOT ARCHER.

ON THE DANGERS OF FLASH LIGHT COMPOUNDS.

[Read before the Photographic Society of Philadelphia.]

BY J. G. BULLOCK AND C. L. MITCHELL, M.D.

WITHIN the last two years the community of Philadelphia has been startled by a series of fatal accidents occurring during the manufacture of magnesium flash-powder, a compound well known to photographers, whereby in all five human lives have been lost. On three several occasions explosions have taken place, each with fatal results, the last and most recent of all resulting in the death of three persons. As a natural consequence considerable attention and inquiry have been attracted to the subject of flash-powders and their probable dangers, and the writers of this paper were requested at a recent meeting of the Photographic Society of Philadelphia to prepare a report upon the subject.

The composition of the particular powder which was the cause of this disastrous loss of life is understood to have been powdered magnesium, chlorate of potash, picric acid and bichromate of potash. No one of these ingredients is in itself explosive except under extraordinary circumstances, and may be considered as safe; but the moment that they are mixed, an element of danger is introduced.

Many finely powdered metals are prone to rapid oxidation; give them the oxygen and the reaction takes place rapidly, and is frequently accompanied by heat and flame. Powdered magnesium and powdered zinc have been known to become sufficiently hot to ignite material in contact with them, on being wet with water.

The addition to magnesium of a chemical rich in oxygen, or holding oxygen loosely, so to speak, increases its susceptibility to rapid change.

For instance, a match applied to some of the powdered metal will fail to ignite it, or occasions a mere glow from slow ignition; but let the magnesium be mixed with chlorate of potash or nitrate of potash to furnish it with oxygen, and the whole mass will flash with almost explosive violence. Again, mix with the magnesium and chlorate of potash some carbon and under some conditions a dangerous explosive will be formed. For instance, oxygen gas is made safely from the heating together of chlorate of potash and oxide of manganese; allow some carbon to be accidentally mixed with the two ingredients and heated and a violent explosion will probably ensue. The rubbing together of chlorate of potash and some organic substances is accompanied with a crackling noise and frequently explosion, as instanced in the combination with sugar or tannin.

Such compounds as we have spoken of are known as explosives, as typically illustrated by gunpowder, a mixture of nitrate of potash, carbon and sulphur. Another and more dangerous class of chemical compounds which may be formed under some circumstances are known as detonators; that is, compounds the component parts of which are held together under so strained a condition of high tension that a very slight cause, such as a light, sharp blow will occasion

them to fly apart violently with a sharp, loud report; in other words they detonate. The force of an *explosion* is felt at a greater distance than that of a *detonation*, but the disruption of surrounding bodies is greater and more complex with the detonation than the explosion. An explosion is generally accompanied by fire and smoke; a detonation is not.

Many detonating compounds may be heated and burned until consumed without discharge, whereas the detonation or snapping of a common pistol cap in contact with or near them, may detonate the entire mass; such is the method adopted in the explosion of mines, etc.

Picric acid is, in itself, we might say, perfectly safe, as it can be burned without danger, and will detonate only when confined. In compound, however, with some other bodies it produces a class of very dangerous substances, notably picrate of potassium, picrate of sodium, picrate of barium, picrate of strontium, picrate of magnesium, and picrate of lead. These substances are extremely unstable in character, and liable to explode with slight percussion or friction with the liberation of immense volume of gas. Sarran states the relative force of picrate of potassium, when exploded, as compared with gunpowder, is as 1.98 to 1.00—almost twice as great. A mixture of 0.5 kilograms of potassium picrate and 0.5 kilograms of potassium chlorate evolves through its combustion 352 litres of gases. One kilogram of gunpowder evolves but 200 litres under the same circumstances.

Picrate of magnesium is, when dry, one of the most unstable of its compounds, and therefore highly dangerous to handle. It may be made in a wet way by double decomposition or by the intimate mixture of the powdered ingredients. Time is, of course, an important factor in the latter process of manufacture, but a microscopical examination of the mixture after long standing will show that the metal has entirely disappeared, and the explosive compound been formed. There is no doubt but that this combination may be greatly assisted by the presence of atmospheric moisture. Powdered magnesium is quite hygroscopic, and has a tendency to cake together in loose masses, or adhere to the sides of a bottle, if exposed to a moist atmosphere. Picric acid when powdered is also rather sticky in character, and it can be readily seen how if these two substances existed together in a mixture they would be attracted to one another; then, given the elements of time, moisture, and perhaps some slight warmth, and a chemical combination would inevitably occur. That this is not simply theory, but fact, can be substantiated by a fact lately mentioned to one of the writers of this article by Professor Henry Leffmann, of this city, in a personal conversation. He stated that some time previous, while microscopically examining a sample of flash-powder which contained picric acid, he was surprised to notice an entire absence of metallic magnesium, the yellow crystals of picric acid being alone prominent. On dropping the powder into water, however, an abundant sediment of metallic magnesium was deposited, showing its presence, and a closer examination of the powder showed that the particles of magnesium were completely enveloped in a yellow coating of picric acid. Of course these circumstances afforded a most fruitful opportunity for the conversion of these two substances into the explosive picrate of magnesium.

Herein is the probable explanation of the late calamity at the laboratory of Wiley & Wallace. A bottle containing in the neighborhood of several pounds of flash-powder, made, after the before-mentioned formula, some eighteen

months previous, was being emptied into a drain for the purpose of getting rid of it. No fire or other chemicals were known to have been present. Water had been thrown upon some of it to aid in its being carried down the drain. Experiments subsequently made proved that the presence of water would not occasion sufficient heat to ignite it. The most reasonable supposition is, therefore, that a small portion of the powder was detonated by an accidental blow, and from thence the entire mass was detonated. No smoke or burns appeared upon the bodies of those killed, or surrounding objects, thus proving the absence of fire. For the preceding disasters by the same powder another theory must be advanced, as they occurred at the time of the mixing of the ingredients, and previous to the probable formation of the picrate of magnesium. In the first case there was an explosion during the process of grinding the material; in the second case, while the powder was being sifted. In the first case it can readily be seen that an explosion would be the natural sequence. In the second case it is probable that some clogging of the sieve occurred during the mixture of the materials. The loss of these five lives is a terrible caution against the use of the especial compound which caused the explosion, and a sufficient reason to regard with suspicion any powder the formula of which is not made public and known to be safe. This especial formula produced a compound which was alike unsafe to make, to use, or to keep. To sell such an article, therefore, for ignorant and unskilled persons to use, or to induce any one to attempt its manufacture, places a fearful responsibility upon those who knowingly undertook such a risk.

It is much to be regretted that the formulæ of most of this class of preparations are not published, and it is highly probable, in many cases, their ingredients have been combined with but little regard to their chemical properties and the chemical reactions which might occur from their admixture. The fact that the compound may bear a label proclaiming it "safe" is but a very slight guarantee when its composition is altogether unknown.

It seems hardly necessary now, in view of all that has been said, to raise a note of warning in regard to the use of all these flash-powders, but the statement has been already made that while this one particular compound was unsafe, other compounds are harmless. The writers wish to state, therefore, that they consider *all forms* of flash-powder dangerous, the difference between them being only in the degree of danger involved. As has been said, they are all composed of substances liable to rapid decomposition when in contact with each other; they are liable to form new compounds often possessing dangerous and unknown properties; their combustion is attended with an intense degree of heat, involving risks from severe burns, and they are liable to spontaneous explosion or ignition. This danger is greatly augmented when they are made or kept in mass, and the probable reason why a greater number of fatal accidents have not occurred is because the powders have mostly been made in comparatively small quantities and put up in separate packages, each containing but a few grains of the mixture. They contain, in most cases, chlorate of potash, bichromate of potash, permanganate of potash, ferrocyanide of potassium, nitrate of potash, amorphous phosphorus, and other highly organized compounds, the very purpose of their admixture with the magnesium being to increase its inflammability and the rapidity of its combustion. This can only be done by making the combination more unstable, and thus introducing at once

a large element of danger. A simple mixture of magnesium and chlorate of potash, which has been claimed to be harmless, if placed in a confined situation, as in a pistol, and discharged by a cap, will detonate, and there is probably no compound of this character which does not possess some element of danger.

Since the introduction of the different forms of the magnesium lamp, in which pure metallic magnesium can be burned with absolute safety, there seems to be but little reason why the use of flash-powder should be continued, and as the only possible advantage in their use over that of the lamp is that a slight amount more of speed may be obtained, the question may well be asked whether the possible advantages to be gained are worth the additional risk involved in the use of the flash-powder.

In conclusion, the following quotation from Eissler's work on "The Modern High Explosives" may well be cited here, more particularly in reference to combinations into which potassium chlorate enters :

"In mixing these compounds great danger is attendant, and too much circumspection cannot be used. They explode instantly upon any violent stroke, very often by friction alone; sometimes spontaneously, as when in a state of rest, and no known cause for their combustion can be assigned. Many are deluded as to its safety by so-called experiments with freshly-made powder. Manufacturers of the compound may attempt to show its safety by hammering it and cutting it, and similar tests; but let the powder be exposed to the natural atmospheric action, attract some moisture, then get dry, and the least friction or blow will cause an explosion."

The writers hope that the knowledge of the danger attending the use of flash-powders is now so diffused that no other accidents will result from their use, and that their manufacture will eventually be abandoned.

A NEW METHOD OF MOUNTING PHOTOGRAPHS ON PAPER WITHOUT COCKLING.

BY ROMYN HITCHCOCK.

THE method of mounting ordinary silver prints which I am about to describe is so readily applied by any person that I am sure it will commend itself to all who give it a fair trial. Those who have large numbers of such prints know very well how difficult it is to satisfactorily care for them. I believe I am right in saying that hitherto no practical method of mounting them except on cards has been devised. But when so mounted they are inconvenient to handle, occupy much space and are constantly becoming disarranged. Albums are out of the question, owing to their bulk as well as their cost.

It will be understood, of course, that these remarks apply only to the preservation of large collections which it is desired to arrange conveniently for reference, and not to a few dozen prints such as would naturally be mounted in an album for the library table. For, however well the mounting may be done on a thin backing of paper, the picture cannot be so smooth as on a card passed through a burnisher.

Photography has now so many applications in scientific investigation that some convenient method of preserving its records will prove of great value. Pictures of all sizes come from different sources, requiring to be classified. The ethnologist receives perhaps the greatest number, and to preserve these is a serious problem. The astronomer, the meteorologist, the microscopist all receive

photographic prints—indeed, there is scarcely any branch of scientific investigation in which photography is not employed, either for illustration or record.

My own collection includes about eight hundred prints. To arrange these has cost me no little thought. A very strong paper is manufactured by the Japanese, in Tokio, which I selected on account of its durability and toughness. It is, however, a paper that cockles very much when moistened by water. My first attempt at mounting on this paper was with the well known alcoholic gelatin solution. I found that fairly good mounts could be made with this solution, but it was not convenient to use, and the prints were not quite smooth. But in order to obtain good results I found it necessary to add a larger proportion of alcohol than the usual formula calls for. My mixture contained so much alcohol that it was quite stiff at ordinary temperatures. To use it the bottle containing it was kept in hot water, and the print was put, face down, on a plate of glass, standing over a dish of hot water, while the mixture was applied to the back. Otherwise, the glue would set before the print was covered.

By working in this manner, hastily transferring the print from the warm glass to its proper place on the paper, and vigorously rubbing it down with a paper-knife, good mounts can be made. But the work is slow and troublesome and the paper does not remain quite smooth.

As the result of considerable experimenting, I have been able to prepare a cement which, as regards convenience and efficiency, leaves nothing to be desired. It works as easily as starch paste; allows of adjustment of the print after it is in contact with the mount (as flour paste does not); is always ready for use, and the mount can be handled with perfect impunity in a few minutes. There is absolutely no cockling.

The prints must first be dried in such a manner that when unrolled they will be quite free from wrinkles, and smooth. My plan is to wet them and squeegee them down on a polished surface, from which they can be easily removed when dry. Ebonite plates serve very well for this purpose, but I had a set of lacquered plaques made for the purpose in Japan, which I much prefer. The prints are squeegeed to these plaques, which are piled up, with blotting paper between them, and weighted down. When the prints are quite dry they are rolled up singly and thus they keep smooth until required for mounting.

The cement is prepared as follows: Good bleached shellac is broken into pieces the size of small peas, placed in a wide-mouth bottle, and enough strong alcohol to cover it poured in. The bottle is then placed in water, which is slowly heated to boiling. A solution is thus obtained which becomes gelatinous when cool. It should be of the consistency of vaseline at ordinary temperature. As thus prepared the shellac, thinned with a very little alcohol, can be used for mounting, but is very much improved by the addition of a small proportion of mastic dissolved in chloroform. An ounce of mastic is dissolved in 2 ounces of chloroform, and the solution filtered through a bit of sponge stuffed into the lower part of a wide glass tube, the end of which is drawn out. I use a test-tube drawn out at the bottom for this purpose.

The proportion of mastic solution to be added depends upon the strength of the shellac solution. About one-sixth the volume of the latter is a good proportion if the shellac is quite thick, and a small proportion of alcohol may be required; but it is important that the proportion of the latter should not be sufficient to thin the mixture too much, for a thin solution is apt to penetrate

quite through the print and to show on the face. The object of adding the mastic is to make the cement work smoothly under the brush.

I have found that if the constituents are properly proportioned the prints will not curl when the cement is applied to the backs. But I am not always able to obtain this very desirable result with a new mixture until after successive trials. The cement should be of the consistency of thick molasses, and should flow easily under the brush.

My method of applying it is as follows : I place the print face down on a smooth sheet of paper on a glass plate, and spread the cement evenly with a brush. Then picking up the print with two hands, I lower it upon the paper on which it is to be mounted, which also lies on a plate of glass, but only allowing one end of the print to touch the paper. The position of this end should be previously marked with a pencil. Now placing the edge of a heavy paper-weight on this end of the print, I lower the other end slowly, running a straight bone paper-knife over the face from left to right, to keep the print smooth and to drive out air-bubbles. The print should then lie flat, and when the edges are pressed down all around it may be vigorously rubbed with a dry cotton cloth. Should any cement have got on the surface, it may be removed with alcohol.

I deem it important to work always on glass surfaces, for the prints must be kept quite smooth all the time.

Some time ago Professor O. N. Rood recommended a solution of shellac in alcohol for mounting prints. The ordinary solution has not proved satisfactory in my hands.

The secret of success in my process is the use of shellac prepared in the manner described. That portion of the shellac insoluble in alcohol is essential to the process. The solution does not dry rapidly like ordinary varnish, but retains its gelatinous condition for a considerable time. It is not very sticky at first, as may be readily observed by testing it between the fingers. As the alcohol passes off it becomes more sticky. The addition of mastic makes it adhere better while still soft.

WASHINGTON, D. C.

CERTAIN PROCESSES FOR TONING OPALOTYPES AND ARISTOTYPES.

BY P. C. DUCHOCHOIS.

At the last informal meeting of the Photographic Section of the American Institute, certain processes for the toning of collodio-chloride of silver prints were communicated, to which I object altogether, because the photographs so toned are exceedingly liable to fade.

The processes in question are not new, so far as chemical action is concerned, and consist in toning and fixing in one operation by adding a solution of auric chloride to another of sodium thiosulphate. The proofs are consequently toned partly by a deposit of gold, and partly by sulphuration, for, by adding auric chloride to sodic thiosulphate, thiosulphate of gold is formed together with sodic tetrathionate, a very unstable salt which soon decomposes into trithionate with liberation of sulphur. Such a bath tones the proof to a fine purple color as rapidly as the alkaline gold solutions, and does not lower the intensity of the image so much, necessitating, therefore, not much over printing. It is for that reason that it is especially recommended for opalotypes and the so-called aristotypes.

The toned proofs consist, as above stated, partly of gold, and partly of silver sulphide, but this only when the bath is new, as by spontaneous changes which occur after a certain period the gold is precipitated and the toning is due then to sulphuration, which requires that the proofs are not washed well in order to leave a certain amount of free silver nitrate, without which the toning proceeds quite slowly, sometimes causing the proofs to be tinged slightly yellow, *i. e.*, to commence to fade. Some authors even recommend to immerse the proofs in the toning-fixing solution without washing them, as they come from the printing frame! But this is not all. To the solution of sodic and aurous thiosulphate it is also directed in one formula to add lead nitrate—whose action as a toning agent it is difficult to understand; and in others, a solution of common alum, and to use the compound when milkiness has subsided. The chemical action which takes place when the thiosulphate is in presence of an acid salt like the sulphate of aluminium and potassium is well known. The thiosulphate is decomposed, liberating thiosulphuric acid, which almost instantly splits into sulphur dioxide, which partly remains in solution, and sulphur in a fine state of division, which slowly deposits. What becomes of the aurous salt in these actions? It is probably reduced, and as a consequence the proofs must be toned wholly by sulphuration. It is for this purpose that alum is added. It has no other use.

Indeed, after the remarkable researches of Davanne and Girard on positive proofs, their constitution and causes of fading, and those of the commission appointed in 1855, by the Council of the London Photographic Society, which consisted of H. Pollock, T. F. Hardwich, J. Percy, and other distinguished persons, researches clearly demonstrating that, to secure permanency as far as it is possible, all sulphuration should be avoided, and the proofs toned by gold or platinum only, and the thiosulphate eliminated as soon as the proofs are fixed, it is incredible that these processes, which date from the infancy of the art, should be revived. We advise the reader to discard these and similar processes as did the old photographers, unless "he does not care a straw whether the proofs fade or not, provided they please and are paid for."

PYROCATECHIN DEVELOPMENT.

BY DR. LEO BACKELANDT.

I HAVE made some experiments with pyrocatechin that may interest the readers of the BULLETIN. These experiments have been conducted in order to find a good formula for this developer; also to compare it with the better known pyrogallol and hydroquinone developers.

I used successively pyrocatechin mixed with carbonate of soda, carbonate of potash and caustic potash.* I used in my solutions also sulphite of soda in order to prevent the oxidizing action of the air on pyrocatechin in alkaline solution.

Pyrocatechin is much more soluble in water than hydroquinone or eikonogen. As very weak solutions of pyrocatechin develop very well I made a rather diluted (2 per cent.) stock solution, adding to it, in order to secure its preservation, 10 per cent. of sodium sulphite. I mixed this stock solution with carbon-

*I did not use ammonia or carbonate of ammonia, as I had already tried these alkalis three years ago, following Dr. Eder's formula (see Dr. Eder's "Die Photographie mit Bromsilber-gelatine"), but I could never obtain satisfactory results.

ate of potash and carbonate of soda in varying proportions, and I diluted the resulting mixture with different quantities of water. I obtained thus colorless solutions that remained clear just as well as ready mixed hydroquinone developer. They gave me very clear negatives with a very agreeable dark tone, similar in appearance to negatives developed with iron oxalate, hydroquinone, or eikonogen; but the development was very slow, especially with carbonate of soda. By using larger quantities of carbonate of potash I could render development quicker, but never to a degree to give me complete satisfaction. I obtained a very good and quick developer in using exclusively caustic potash. For this purpose I made a 10 per cent. solution of caustic potash and I mixed it in varying proportions with my stock solution of pyrocatechin; by these experiments I observed that very diluted solutions could be used for development.

After several experiments I propose the following formula :

STOCK SOLUTION I.

Sulphite of soda.....	10 parts.
Pyrocatechin.....	2 “
Water.....	100 “

STOCK SOLUTION II.

Caustic potash.....	10 parts.
Water.....	100 “

Both solutions keep very well; they can be preserved separately or mixed.

For developing mix 1 vol. Stock Solution I with 1 vol. Stock Solution II, and add eight or ten times as much water as there is mixture.

For example, take—

Stock Solution I.....	5 c.c.
Stock Solution II.....	5 “
Water.....	100 “

Such diluted developing solutions will keep very well in corked bottles; they will develop several plates, and when exhausted it is sufficient to add some concentrated developer (mixture of Stock Solution I and Stock Solution II) to give back its former activity.

When the developer is quite new it is liable to render the first plates foggy unless a few drops of potassium bromide solution are added. Don't add too much bromide solution, as it retards development considerably.

The best method is to always add to new developer a certain quantity of old developer with which some plates have already been developed.

I made some comparative experiments with pyrogallol, hydroquinone, and pyrocatechin, in order to determine if pyrocatechin presents any advantage to these developers in regard to the time of exposure.

For that purpose I exposed several films under the same conditions in Anthony's standard sensitometer. The films used were Anthony's rapid Climax films, coated with the same emulsion. The standard light that I adopted was a regulated gas flame, situated at the same distance for every exposure. Every film was exposed exactly under the same conditions during thirty seconds, and afterward they were developed separately in different developers. Every developer was used in such a manner as to be in the most favorable conditions.

Pyrogallol, hydroquinone, and pyrocatechin all gave the same numbers of the sensitometer, and pyrogallol and hydroquinone produced always a better density than pyrocatechin.

The above experiments show us that it is an error to think that the use of pyrocatechin would allow us to give shorter exposures than those required by using other developers.

The special advantages of pyrocatechin are that it gives very clear negatives of good printing qualities, and that it can be used in very diluted solutions. Its great solubility in water allows us to prepare a very concentrated developer that could be kept in very small bottles, and that could be diluted afterward with water in the required proportions.

Such a developer would be a boon for the traveling amateur photographer, who does not like to carry with him large bottles of developer. It would be possible to put in a very small bottle a very concentrated stock solution of pyrocatechin developer that could be diluted as required, and that would be sufficient to develop all the plates used during his trip.

The price of pyrocatechin is still very high, but in consideration of the small quantity of this product to be used for developing, its use is not much more expensive than that of hydroquinone or eikonogen.

DUST.

BY A. HEWGAG.

IN one of the annuals for 1890 there is an article upon dust. It is of the usual type, and it arouses my bile. I have heard about dust before. I have had the plate maker's agent, or salesman, stand at my side and look over my negatives. When I complained of pin-holes he would gracefully sit upon me. The old story would be rubbed in, and I would be convinced that I was very wicked because I had not dusted those plates before exposure. It is told of a St. Louis man years ago that he did not object to beans for a "limited number of meals, say two or three hundred," but he "could not stand them for a steady diet."

Now, that was my gait, exactly. I could stand the thing for two or three hundred times, but I kicked when it began to take the form of a "regular" comment. Well, at last I got a brush; confiscated a soft one that had not been used for any other purpose and began to dust my plates. I noticed that it didn't change the story, however. The spots came in the negatives, and they came after I had dusted my plates most carefully. You see that there was dust in the camera. "Dust got into the plate holders." "The plates shook about and rubbed off particles of the wood." I thought this last was pretty strong, for in my Fairy holders the plate comes in contact with nothing but metal.

I am afraid I got angry. Possibly I manifested the fact that I was not intensely happy. But all the same, that Fairy camera got a dusting, inside and out. Those holders were dusted as well as the plate. When I went out I had everything carefully wrapped up to exclude *dust*—in capital letters.

And with what result, do you ask? Why, they sang the same old song: "Why didn't you dust your plates?" Then I became a bold, bad man. I resolved that I would do something wicked. I would commit crime, but I would hear no more of that song about dust. McGinty had not then invented lead-lined pockets; even the harmless, antiquated chestnut bell, with its sorrowful tolling, was not available, because it had not yet been thought of. But I got there all the same.

I made a long summer trip into Vermont. The plates used were rapid and as good as the average, perhaps a little better, and I came home with about 70 as pretty 5 x 8 negatives as one could wish to see. But there was the usual quantity of dust. Most of them showed it. Some had bad attacks. But I was ready for the dustman. I had taken my printer into my secret, and one day we were considering the question of dust, as we had been before I started, when I walked the agent of the plate maker. I was introduced, and my pretty negatives were brought out to show what his plates could do. I had a good many compliments, and certainly some of those negatives deserved them. Vermont subjects are all that one could wish to give fine negatives, and when one has a Dallmeyer there is no reason why he should not have something to be proud of. All went as merry as the proverbial "marriage bell" until it came time to say something about the little spots and pin-holes. It was a pity that I had not dusted my plates. This just as the last negative in the pile was laid down. Then the man who did the printing said something about my having always dusted in a peculiar way. "How was that?" I then explained that every negative, as it went into the holder, had one half of its length very carefully dusted. "One half only! Why do you not dust the whole?" As I wanted to be sure that it was of service I said that I had taken this course. The dustman made a dash for the pile of negatives, asking, "Which half was it that you dusted?" To this I could only answer that it was that which happened to be most convenient.

Did I gloat? Was I happy? He went through a pile of the negatives. I will not say how many. He utterly failed to discover one of which he could say that one-half was any less free from dust than the other. I let him hunt till he was tired and I said nothing. It was worth all the misery that I had endured from all the dustmen of ages. When he finished he only said: "Give Mr. Hewgag a box of our plates and charge them to my account." Perhaps the possession of those plates was not sweet! Now let me advise. Just try the plan of dusting one-half of each plate; then examine the alleged dust spots with a strong magnifying glass. The experimenter may not have the exquisite satisfaction that I had with my dustman, but he will be put beyond the reach of the dust sermons and will have vastly less on his conscience if he should happen to forget to dust a plate on putting it into the holder. It is almost unnecessary to add that after putting a few negatives under the microscope, as a final proof, I have ceased to trouble myself about the one-half of the plate. I let the plate-maker attend to the dusting now, and have quite as good results as before and vastly more peace of mind.

THE SALTING AND EXCITING OF DRAWING AND OTHER COMMERCIAL PAPERS.

BY LYONEL CLARK.

(Continued.)

WE therefore make our first note, and that is some organic substance should be added to the chloride of silver, to form an image that will resist fixation.

Now, paper in itself contains an organic substance in the size, which is added to the cellulose to give it strength and firmness. The kind of size that is used in the preparation of different papers varies very much. Foreign papers are prepared with resins, French papers often with arrowroot, while English makers use the common sorts of gelatine obtained by boiling hides and hoofs, the product being subsequently hardened by alum. All these different substances combining with

the silver, form chemical compounds acted on by light, but each giving, under its influence, differently colored subsalts. For instance, starch or resin tends to give purplish tones, while gelatine and albumen give red or yellowish red tones. Moreover, the quantity of size present varies very much, according to the make of the paper. Blotting-papers are practically unsized, whereas some of the glazed varieties of surface paper are all size. But, as a general rule, most papers require a fresh addition of size to give them good printing qualities, the quantity to be added depending naturally on the quality of the paper used.

The sizing of the paper plays, moreover, another rôle, and that is it tends to keep the light sensitive compound on the surface of the paper. It is quite clear that the visible image must be on the surface of the paper, because it is only the mere surface layer of coloration that is seen by reflected light, and therefore for this reason alone we should do well to add as much size as we conveniently can to our papers, short of giving the objectionable gloss or glaze that so characterizes the common albumenized papers.

I find that a rough porous paper, like Whatman's heavy rough-surface drawing-papers, will take about 12 grains of gelatine to the ounce of solution without showing. This quantity should, however, be halved if one of the H. P. variety of this maker's papers be employed, and some hard bank posts and cartridges require still less. The worker must himself vary these quantities to suit the variety of paper he is using, remembering that the sizing fulfils two rôles—it serves to form an organic silver salt insoluble in hypo, and secondly, to retain the same on the surface of the paper. The generality of papers that one is likely to use for printing already contain a fair amount of size in their composition, and therefore the sizing and salting baths are applied at the same time in one operation. But should the paper be found to be very porous, say plate paper, it may be necessary to give it a preliminary sizing, which should be done by immersing the sheets of paper bodily in a 3 per cent. bath of gelatine, or a 2 per cent. bath of arrowroot. To this, in warm weather, a little alum may be added, say the same quantity, to harden the size and stop up all the pores of the paper. The paper should be dipped twice, allowing it to nearly dry between each operation, the paper being hung up to dry the reverse way after the second operation. This is to equalize the coating, as otherwise the lower end would be richer in gelatine than the upper end, for the heavy liquid naturally gravitates downwards.

The quality of gelatine used is not very important, providing that it be free from color, the ordinary edible variety being perfectly suitable. The quantity required should be put into clean water to soak and swell. When this has taken place, which can be easily told by its appearance, it losing its horny character and becoming semi-transparent, the water should be poured off and hot added. It should then be heated till the gelatine all dissolves, being well stirred during this operation, and in this state it is ready for use. The paper may be at once dipped in the warm gelatine; in fact this is advisable, as, if the solution is nearly cold, and is just on the point of becoming a jelly again, the cold paper will cause it to dry in gelatinous streaks, instead of forming an even coating. For this reason it is advisable, in cold weather, to dry the paper in front of a fire or in a warm room, so that the excess of size may freely drop off.

If arrowroot be used, the preparation is slightly different. The arrowroot should be first mixed into a stiff paste with cold water, and then hot water added

with constant stirring, and the whole brought up to the boil. The arrowroot will then lose its milky appearance and become clear and glutinous. In this state it will be ready for use.

Although I give directions for the preliminary sizing of paper, in case the want of it may arise, still, as a matter of fact, nine out of ten samples of paper will not require it at all, and the sizing that they require to keep the image on the surface may be applied at the same time as the soluble chloride with which they are salted.

The object of the addition of this chloride is to form, by double decomposition with the nitrate of silver, silver chloride on the surface of the paper. We will resort to experiment again to ascertain the effect of this salting. We will now take two slips of paper, and soak the one in barium chloride and the other in nitrate of silver; when they are dry we will treat the salted one with silver nitrate, and the nitrated one with barium chloride. We shall then form on each of them silver chloride, but with the following difference: the one that was salted first will have silver in excess—that is to say, that after all the barium chloride has been formed into silver chloride, there will still remain on its surface a certain amount of silver nitrate unaltered. Whereas, on the second slip, the opposite will obtain, that is to say, unconverted barium chloride will be in excess. Now let us expose these two strips of paper. We shall find that the second strip with the excess of chloride will begin to darken slightly before the other; but the one with nitrate in excess will soon begin, and once begun, will rapidly catch up the first, and whilst the first slip never attains beyond a slight purplish discoloration, the other one will darken through red, reddish purple, almost, under some conditions, to black. We at once learn then, that the nitrate of silver must be in excess, and this is the reason why the chloride or salting mixture, as it is called, is applied to the paper before it is excited in the nitrate of silver bath.

And now comes the question, what chloride are we to use? It is pretty clear that all we require is the chlorine, and it would seem, therefore, the simplest way would be to use chlorine water or hydrochloric acid; but, as a matter of fact, these substances do not do, but almost any of the soluble basic chlorides answer extremely well. They have each a slightly different result, but so slight that it can be neglected in practice, and the ammonium, sodium or barium chlorides used indiscriminately. We should naturally expect that the different chlorides should produce different results, for at the same time that chloride of silver is formed, the nitrate that was with the silver forms a soluble salt with the base of the chloride. That is to say, ammonium chloride and silver nitrate give us silver chloride and ammonium nitrate, or, if potassium is used, we shall get potassium nitrate, or if barium, barium nitrate; and since some at least of these soluble nitrates will be left and dry on the paper, they may have an influence on the resulting print. With the chlorides I have named above, however, the difference is absolutely negligible. But we must not forget, however, that there is a difference in the quantity of chlorine present in equal quantities of the different chlorides; for instance, 10 grains of ammonium chloride contain as much chlorine as 11 of sodium or 22 of barium chloride.

Barium chloride is the one generally used, but, as a rule, I prefer the ammonium chloride, for if a soluble citrate be added to the barium chloride, an insoluble white precipitate is formed, and a citrate is often a useful addition to the

salting bath. It is for this reason that I use chiefly ammonium chloride, and all my remarks to-night will apply to this salt. I may mention that the crystalized variety of this salt should be obtained, and not common sal ammoniac, as this salt, through the evaporation of ammonia, becomes very acid.

We now arrive at a very important point, and that is, what strength or quantity of chloride should we apply to the paper? To settle this we must resort to experiment. The strips of paper that I have here have been prepared on salting baths of different strengths, namely, 1, 2, 4, 8, 16, 32 grains of ammonium chloride to the ounce of water. They were then excited on three different preparations of silver baths—the ordinary silver nitrate, silver citrate, and ammonio-nitrate of silver. The upper half of the strips represent a short exposure, in other words, the rapidity; and the lower halves, the prolonged action of light, or intensity.

A glance shows that rapidity increases almost directly as the amount of salt present, as does also intensity or the maximum amount of darkening; that is to say, a heavily salted paper will be more rapid and give a stronger image than a weakly salted one.

It will be noticed that in many cases where the maximum amount of salt has been applied to the paper it has darkened unequally; the cause of that is found by referring to one of our early experiments, that one that showed us that we should have the nitrate of silver in excess. Now, in these cases the paper was so rich in salt that nearly all the nitrate of silver was converted into chloride, and the paper, lacking this sensitizing power of the free nitrate, has darkened unequally. On rough papers, even with 16 grains, I have found a tendency, especially if the silver be applied with a brush, to this same unevenness, and, therefore, as a standard bath I prefer one containing eight grains to the ounce.

But we have not yet done with our slips. We can ascertain from them another fact, and that is a way for compensating for feeble or too hard negatives; or in another way, how to obtain either a vigorous or a flat pull from an ordinary negative.

If we take the least salted slip we find that the most exposed portions are not nearly as dark as those in the highly salted slip, and this is still more evident in the slightly exposed portions. Now a hard negative simply means that it requires a powerful light or a long exposure to penetrate the deposit; during this time the clear glass portions are being rapidly overdone. If we, therefore, so prepare our paper that the portions under the clear glass, that is, the shadows, refuse to darken rapidly, we shall not be afraid of using a bright light to bring out the high lights, for we have obviated the danger of the shadows solarizing. Therefore, for a hard negative, we see the amount of salt may be reduced. For a thin negative, where exactly the opposite obtains, that is to say, where we want the clear glass to darken with all speed possible before the shadows under the thin deposit are too much reduced, we should increase the quantity of salt. The difference in the intensity of the light between winter and summer has the same tendency, and the quantities I have given (*i. e.*, eight grains to the ounce) are about a winter's light allowance, and will probably be excessive in summer time.

We may now give what one may call a winter salting-bath, made up as follows :

Gelatine.....	240 grains, 28 grams.
Chloride of ammonium.....	160 " 19 "
Water.....	20 ounces, 1 litre.

When we were simply sizing the paper, we dipped it bodily into the sizing liquid; our object then was to fill up all the pores in the paper, but in salting all we require is a thin layer on the very surface of the paper, for we know that the coloration of the outer reduced film of chloride will protect the interior and keep it perfectly white, and therefore it is only the outside which is of use in forming the image; but all the salt in the paper must be converted into silver chloride by the addition of the nitrate, and unless, therefore, a very large quantity of this be applied we shall have no free nitrate in excess, and this excess we have learnt to be an absolute necessity. So that if we were to immerse the papers bodily we should only be forming absolutely useless silver chloride in the body of the paper, unaffected by light, and not forming any image but which would be simply fixed out again in the hypo and wasted.

Therefore, I strongly recommend floating the papers, or the thick varieties at least. Thin papers do not, of course, matter; the quantity that they take up will be so small—they are practically all surface.

(*To be continued.*)

[*From the British Journal of Photography.*]

THE NEW BENZOLINE LIMELIGHT.*

BY ALBERT W. SCOTT.

Conditions of Safety.

WHEN Lieutenant Drummond introduced the limelight for signaling and other purposes, in 1830, it was christened the oxyhydrogen light, because it was produced by the intense heat of a blowpipe flame, fed by a mixture of oxygen and hydrogen, acting upon a small ball of lime. The light so obtained was estimated as being equal to 122 wax candles of $1\frac{1}{8}$ of an inch in diameter.

Pure hydrogen, obtained by the action of acids on metals, was employed in the first instance. In order to avoid the expense and trouble of making this gas, the spirit jet—incorrectly named the oxycalcium jet—was introduced, in which a lamp fed with methylated spirit replaced the hydrogen. This is the least powerful form of the limelight, being usually estimated at 150 standard candles. It is now rarely used.

When coal gas became available for lighting purposes, and procurable in every town at a cheap rate, it was natural that, for the limelight, hydrogen should be replaced by the cheaper gas, which gave a light about equally brilliant with the jets then made.

Coal gas and oxygen are the gases now most popular with lanternists, who are the chief users of limelight. The jets which are employed are well known, and are divisible into two distinct classes. The blow-through jet, for which coal gas is supplied from the main, and oxygen from a cylinder or gas bag under pressure boards, gives a light between 150 and 250 candle power. The mixed gas, or chamber jet—in the use of which both gases are compressed into cylinders, or are put separately into bags equally weighted—yields a light with ordinary commercial jets varying from 200 to 400 candle power.

*A brief description of this limelight is given in *The British Journal Photographic Almanac* for 1890, just issued.

The English "Benzoline" is what is called Benzine in America, a product of petroleum.—EDS. of *ENGLISH*.

Ether saturators have been for some years before the public, but have not come very largely into use as yet ; although, as the conditions of safety are becoming better known, the prejudice created by certain accidents which have occurred is passing away. Ether is perfectly safe if used in a properly made stuffed saturator ; but to use it in a loose liquid state, in an unstuffed tank is dangerous. It is this latter form which has injured the reputation, as regards safety in use, of the ether saturators. I have never heard of any accident caused by a stuffed saturator.

The light produced by the use of ether and oxygen is about equal to that of the oxyhydrogen light with mixed gas jets of small bore ; but with jets of larger bore, ether is not quite equal to coal gas in brilliancy ; moreover, in the latter case ether burns less quietly, and is more apt to "pop" than coal gas.

I may explain that by a small bore is meant that usually adopted in commercial jets, viz., about $\frac{1}{20}$ or $\frac{1}{15}$ of an inch in diameter ; by a large bore is meant an aperture in the nipple of about $\frac{1}{15}$ or $\frac{1}{12}$ of an inch in diameter.

The "pop," otherwise known as the "pass-back," is the little harmless crack caused by the explosion of the small quantity of mixed gases contained in the mixing chamber of the jet. This crack or "pop" sometimes occurs with coal gas when the gases are turned off quickly. The pop is more apt to occur with a large aperture in the nipple than with a small one, and more likely with a low pressure of gas than with a high pressure ; hence it follows that most nipples are only safe from a pop so long as the gas is supplied to it with some degree of pressure ; when the pressure is taken off, as occurs in turning off both taps of the jet simultaneously in order to put out the light, then the pop is heard. If one tap is turned off before the other there is, of course, no pop in the case of the oxyhydrogen light, because neither oxygen nor coal gas is explosive by itself ; it is only the mixture of the two which can produce a pass-back. If a pop occurs when an ether saturator is being used, it is evident, as the mixture of oxygen and ether vapor is explosive, that the flame, having reached the mixing chamber, will travel from the jet through the rubber tube down to the ether vessel, that is, if no pumice chamber or flame extinguisher is interposed. As there is more gas in the rubber tube than in the mixing chamber, the pop is much louder with an ether saturator than with coal gas ; it is like the crack of a small pistol.

If the saturator is a stuffed one no damage whatever is done ; but if it is an unstuffed tank then a serious accident is more than probable, especially if the charge of ether is half exhausted. There is then enough explosive gas in the saturator to fill a half-pint measure, or possibly a larger one, and the explosion of this quantity is sufficient to rend asunder very strong vessels ; the liquid ether is splashed about in a flaming condition, and of course there is a great mess.

It is in this way that all the accidents with ether saturators have occurred. A pop has taken place at the nipple, the flame has traveled from the mixing chamber to the tank, and it has exploded ; hence, I must denounce all unstuffed saturators charged with inflammable liquid as unsafe. If the vessel is stuffed it does not burst ; there is no loose fluid to be scattered about, and consequently there is safety. The pop is easily avoided by keeping up a fair pressure of gas on the nipple as long as the light is wanted. One of the two taps of a jet should be always full on ; it does not matter which. In extinguishing the ether light

both taps should be turned on full in the first place; then the vapor tap which supplies the ether is turned completely off. A current of pure oxygen quite free from ether will then impinge on the lime. Pure oxygen does not burn in air, consequently the lime soon grows cold. When it has ceased to glow, which will occur in about one minute, the oxygen may be turned off without fear of a pop.

There are some jets made which have their mixing chambers filled with grains of broken pumice stone, which form the pumice chambers invented by the Rev. Hardwich. If properly made, these are flame-proof, and there is then not the slightest chance of a pop. I have described the conditions of safety with ether saturators because they are equally applicable to the new benzoline saturators.

As a pop is caused by insufficient pressure of gas it is advisable to put out the light before the available supply of oxygen is exhausted. There are some occasions, however, when a pop is useful as part of the programme of an evening's entertainment.

Recently a gentleman was lecturing with an ether saturator before an audience. He had nearly reached the end of his programme, and was exhibiting the set of twelve slides called the "Passions," a tale of a handsome policeman and two rival servant wenches who were in love with the "bobby." One maid was preferred by the gentleman, who was duly invited to partake of good things in the kitchen by the fortunate cook. A picture was being shown on the screen showing the rejected and disconsolate maiden vowing vengeance on the lovers. Just then the supply of oxygen ceased, the pop took place harmlessly, and the series of pictures was ended. It was subsequently discovered that the audience was under the impression that the pop was part of the programme, and simply meant that the angry damsel had seized a pistol and had shot her rival!

OBITUARY.

EDMOND V. BOISSONNAS.

LAST summer we heard from friends in Geneva, Switzerland, that Mr. Edmond V. Boissonnas was coming to the United States with Mr. G. Cramer, the well-known manufacturer of dry plates. Having had considerable correspondence with the gentleman, and also remembering the fame of his illustrious father, we felt anxious to meet him, but unfortunately in his passage through New York circumstances forbade our meeting him, and we deeply regretted our misfortune. Now we are still more sorry, for all hope of seeing him has gone forever. We regret to have to record the sad intelligence just received from Mr. Cramer that he died on Saturday, January 25th, of typhoid fever, after a short illness, and at the early age of twenty-seven and a half years.

Mr. Cramer, with whom he has been associated since last spring, says of him: "He was a young man of remarkable talent, rare abilities and a highly honorable character, a worthy son of his father, who gave the name Boissonnas a world spread reputation amongst photographers. His sudden death will be one more great bereavement to his family, and particularly to his aged mother, the father having died one year ago."

His greatest achievements were in the line of ortho-chromatic photography; and we have in our possession a fine series of pictures, illustrating this interest-

ing branch of our art, that we shall treasure now more highly since he who gave them will never more be able to give us such evidences of his genius and skill.

The funeral took place on January 27th, at St. Louis. President Bain and members of the St. Louis Camera Club, Mr. Robert Benecke, Mr. Earnest Cramer, and representatives from Mr. G. Cramer's works, acted as pall bearers. To his bereaved family and friends we tender our heart-felt sympathy in their great affliction.

“ There is a Reaper whose name is Death,
And, with his sickle keen,
He reaps the bearded grain at a breath,
And the flowers that grow between.”

OUR ILLUSTRATION.

IN this issue of the BULLETIN we present our readers with a handsome photograph of the design for the monument to Daguerre to be erected at Washington. We are enabled to do this through the kindness of Mr. H. McMichael, who furnished us the photograph on his return from the meeting of the Executive Committee of the Photographers' Association just held there. In giving this view we are changing the usual order of pictures in the BULLETIN, and we shall give the silver print, that properly belongs with this issue, in the second issue of the month.

Below we give the names of the members of the various local committees in our large cities who have undertaken to collect the necessary funds to defray the cost of the monument, which we understand to be \$6,000. The design is by Mr. J. S. Hartley, the artist, and will be of an imposing character, 11 feet high:

LOCAL COMMITTEES, DAGUERRE FUND.

New York.

J. WELLS-CHAMPNEY, *Chairman*,
Dr. E. L. WILSON,

Dr. A. H. ELLIOTT,
W. I. LINCOLN ADAMS,

H. LITTLEJOHN.

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G. CRAMER, *Chairman*,
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M. A. SEED,

W. H. H. CLARK,
J. C. SOMERVILLE,
H. A. HYATT.

THE PHOTO-MECHANICAL PRINTING METHODS AS EMPLOYED IN THE JUBILEE YEAR OF PHOTOGRAPHY.

BY THOMAS BOLAS.

(Continued.)

A Woodbury relief is developed upon a plate of silvered copper (but the relief need not be nearly so high as that required for the Woodbury process; in fact, an ordinary carbon print will answer), and when the relief is taken out of the developing water, it is dipped into a solution of potassium bichromate, drained and dusted over with fine sand—this sand having been previously waxed by being heated in an iron pot, and stirred up with a small proportion of wax. The layer of waxed sand is allowed to remain on the film until it is quite dry, when it is brushed off, leaving the gelatine granulated or pitted all over; the pits being deepest in the thick parts. The plate is now blackleaded, and a cast is made in the electrotype bath, this cast being the printing plate.

Numerous specimens show what excellent work can be done with this method, and you must remember that Major Waterhouse has not only published full working details, but he has demonstrated the process before several gentlemen interested in the matter; moreover, he has not patented the method.

Some fine examples of the application of photo-engraving to pottery decoration are due to the skill of Mr. F. J. Emery, of Burslem—and one photographic method which this gentleman adopts for the reproduction of pottery designs is of special interest. He coats a plate with sensitive bitumen, puts down upon this surface a transfer from the plate to be reproduced, and exposes to light until the light ground is insoluble. Development is now effected with the usual solvents—say, a mixture of turpentine and benzole; only those parts of the ground which were protected by the transfer dissolving. The etching is effected by perchloride of iron.

In connection with intaglio plate work, special mention must be made of the method of etching copper by means of a solid image of chloride of silver, due to Obernetter, and called by him *Licht Kupferdruck*. A gelatino-bromide image in film form and made from an emulsion rich in silver is converted in chloride of silver by immersion in a chlorinating solution—a weak solution of bichromate of potash acidified with hydrochloric acid answers well—and this chloride of silver film is laid on a smooth copper plate. The chloride of silver becomes decomposed, the chlorine uniting with the copper and etching it, so that every detail is reproduced as an intaglio. Unless the action is assisted by a weak electric current it is very slow; but when the copper plate is connected with the positive wire of a battery, and the negative wire is connected with a carbon plate placed behind the film picture, the etching of the plate proceeds quickly. The film picture should be moistened with weak salt and water.

(To be continued.)

The style and general appearance of your BULLETIN is excellent, and the numbers you have sent me have been very much admired here. There is hardly a paper of that nature which can show such a fine technical execution in printing, and such a sense for elegance and solidity, as your BULLETIN.

VICTOR SCHUMANN,
Leipzig, Germany.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.O.S.**
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

THE SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

THE regular monthly meeting was held on Tuesday evening, January 14th, *President C. W. CANFIELD* in the chair. Communications from the secretaries of the London Camera Club and the New Orleans Camera Club were read. Mr. F. C. Beach read a paper on "Camera Shutters," treating the subject very exhaustively, and exhibited a number of different models. He thought most all shutters were operated either by gravity, spring power, or pneumatic power. Mr. Cyrus Prosch exhibited a skeleton model of his present triplex shutter, and a model of the first one he invented. He spoke on the practical side of the question, and had tried to produce a commercial article that could be depended upon.

Professor L. H. Laudy thought the word "instantaneous" should not be used, as there was not and could not be an instantaneous shutter. All required an interval of time to operate. He liked the Haddon shutter very much.

Mr. William T. Gregg preferred a shutter operating between the lenses, and exhibited a model of his diamond shutter, called such because of the diamond-shaped diaphragm it made. Very few shutters worked quicker than the one-hundredth part of a second, and the average about the one-fiftieth of a second.

Mr. W. T. Wintringham exhibited his quick shutter, having two blades operating in opposite directions. Mr. H. M. Grisdale showed a combination drop and door flap shutter having attached spring hinges, designed to prevent the jar of the doors as they fly open. He also explained a model of a shutter (sector shaped) in which a simple movement of one lever actuated by a spring operated two blades in opposite directions. He believed in having the apertures in the shutters considerably longer than the actual area of the lens, in order that a large amount of light may enter it.

Mr. F. C. Beach exhibited a prayer-book camera, invented by Mr. Krugner, of Germany, which had a self-setting shutter, simple device for changing plates, and was very easily operated. It carried twenty little plates about 2 inches square. Mr. A. Peebles Smith made flash light exposure of the audience early in the evening, developed the negative, dried it, placed it in Dr. Just's automatic exposing and photo-printing machine, sent by the United States Photographic Supply Company, and exposed, by the aid of an incandescent electric lamp, thirty impressions on a continuous band of bromide paper. These were quickly developed with the eikonogen developer in large trays, fixed, cut off, and the prints presented to each member of the audience before the meeting broke up.

The Secretary read the Treasurer's quarterly report, showing a good balance in the treasury.

The resignation of Mr. David Williams as Vice-President and Director was read and accepted. Mr. Alfred L. Simpson was elected to fill the vacancy. After passing a small appropriation from the special fund, the meeting adjourned.

F. C. BEACH,

Secretary.

THE BULLETIN is ever present in my parlor and among my photographic gems. It is also a great reference book when at a loss in solving some difficulty. Don't let the issues miss me.

W. A. MORSE,
Chicago.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

Treasurer's Account.

G. M. CARLISLE, Treasurer, *in account* with the PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

<i>Dr.</i>			
1889.	To cash on hand as per last report.....	\$2,895 73	
	Received from Theodore Endean, after making report.....	20 00	
			\$2,915 73
	“ 238 new members, at \$5.....		1,190 00
	“ 306 members, dues at \$2.....		612 00
Aug. 12.	“ O. P. Scott, for floor space.....		1,127 50
	“ C. H. Codman & Co., for floor space.....		110 25
	“ Public admission (1,325).....		331 25
23.	“ Harvard Dry Plate Co., floor space.....		110 25
	“ E. & H. T. Anthony & Co., floor space.....		141 75
Sept. 3.	“ O. P. Scott, floor space.....		340 75
Nov. 15.	“ Eastman Dry Plate Co., floor space.....		141 75
Dec. 23.	“ O. P. Scott, floor space.....		247 25
	“ O. P. Scott.....		264 40
	“ 206 extra buttons, sold at 25 cents.....		51 49
	“ Interest to July, 1889.....		75 14
			<u>\$7,659 51</u>
<i>Disbursements, 1889.</i>			
Jan. 19.	Paid Draft No. 1, J. M. Appleton, expenses attending Executive Committee meeting.		\$75 15
	Paid Draft No. 2, O. P. Scott, expense attending Executive Committee meeting.....		95 00
	Paid Draft No. 3, H. McMichael, expense attending Executive Committee meeting.....		75 00
	Paid Draft No. 4, G. M. Carlisle, expense attending Executive Committee meeting.....		14 35
	Paid Draft No. 5, S. G. Greenwood, typewriting.....		5 95
	“ “ 6, Snow & Farnum, printing.....		5 50
Mar. 6.	“ “ 7a, Snow & Farnum, printing.....		2 25
	“ “ 7b, Mathews & Northrop, printing.....		12 27
Apr. 25.	“ “ 8, Chicago Printing Co., diagrams.....		16 50
June 12.	“ “ 9, D. E. Wyand, electro plates.....		46 00
July 1.	“ “ 10, William R. Brown, rosettes.....		30 00
Aug. 13.	“ “ 11, Boston Electric Light Co.....		112 50
	“ “ 12, J. M. Appleton, expense.....		77 10
	“ “ 13, S. G. Greenwood, stenographer.....		148 54
	“ “ 14, Boston Police Department.....		43 72
	“ “ 15, George H. Hastings, expense account, as per vouchers.....		68 50
	“ “ 16, George H. Hastings, expense account, as per vouchers.....		104 22
	“ “ 17, Mass. Mechanics' Association, rent.....		675 00
	“ “ 18, Boston <i>Globe</i> and <i>Herald</i> , advertisements.....		22 80
	“ “ 19, H. McMichael, expense account.....		152 50
	“ “ 20, G. M. Carlisle, expense account.....		75 00
	“ “ 21, O. P. Scott, expense account.....		124 50
15.	“ “ 22, The Scovill & Adams Co.....		100 00
	“ “ 23, Mathews, Northrop & Co., Souvenirs.....		383 00
	“ “ 24, Tiffany & Co., medals and buttons.....		1,275 00
	“ “ 25, O. P. Scott, commission account.....		200 00
Dec. 2.	“ “ 26, George Murphy, circulars.....		5 50
	“ “ 27, Mathews, Northrop & Co., printing.....		29 25
	“ “ 28, For partitions.....		18 67
31.	“ “ 29, O. P. Scott, balance of commission.....		274 37
	“ “ 30, G. M. Carlisle, 10 per cent of receipts.....		474 37
			<u>\$4,742 51</u>

Brought forward.....	\$4,742 51
Postage.....	\$9 50
Commission paid Secretary Potter (Endean).....	2 00
“ “ Treasurer Carlisle.....	2 00
Express.....	3 25
Expense to Boston Hall business.....	4 00
Messenger boy.....	35
Telegram.....	53
	<hr/> 21 63
Total disbursements.....	\$4,764 14
Cash in Banks.....	2,895 37
	<hr/> \$7,659 51

Recapitulation.

Paid for expense, 1889.....	\$4,764 14
Cash received, 1889.....	4,743 78
	<hr/>
Expense in excess of receipts.....	\$20 36

There is yet due the Association \$40, which when paid, will show a gain of \$19 64

Respectfully submitted,

GEORGE M. CARLISLE,
Treasurer.

P. S.—Received after this report was made up :

From E. & H. T. Anthony & Co., for advertising in Souvenir..... \$20 00

Secretary's Account.

O. P. SCOTT, *in account* with the PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

1889.

August 10. Received from B. French & Co., for space.....	\$52 00
“ J. A. Knorr, for space.....	21 25
“ S. Wing, for space.....	10 00
“ George Heyn.....	10 00
“ J. A. Schindler.....	15 00
“ G. Gennert.....	31 90
“ Acme Burnisher Co.....	31 50
“ Eagle Dry Plate Co.....	110 25
“ Smith & Pattison.....	141 75
“ Blair Camera Co.....	195 50
“ Schwartz.....	82 50
“ J. C. Sommerville.....	55 00
“ Scovill & Co.....	141 75
“ Stanley Dry Plate Co.....	141 75
“ Entrekin Burnisher Co.....	121 50
“ Seed Dry Plate Co.....	114 00
“ Packard Bros.....	114 00
“ Wilson Hood.....	36 00
“ George Murphy.....	36 00
“ White Chair Manufacturing.....	36 00
“ A. M. Collins & Co.....	60 00
“ Mr. Schultze.....	60 00
“ J. Gilbert.....	13 50
“ Morris Earl & Co.....	42 75
“ J. W. Bryant.....	88 00
“ G. Cramer.....	82 50
“ Scovill, Adams Co. (advertisement in Souvenir).....	15 00
“ A. M. Collins (advertisement in Souvenir).....	10 00

Carried forward..... \$1,869 40

1889.	Brought forward.....	\$1,869 40
August 10.	Received from G. Cramer (advertisement in Souvenir)	15 00
	“ Seed & Co. (advertisement in Souvenir)	10 00
	“ Wilson Hood (advertisement in Souvenir).....	5 00
	“ Acme Burnisher Co. (advertisement in Souvenir).....	10 00
	“ Gundlach Lens Co. (advertisement in Souvenir).....	10 00
	“ Air Brush Co. (advertisement in Souvenir).....	10 00
	“ Mr. Knapp.....	25 00
	“ L. W. Seavey & Co.	60 00
	“ Sprague & Hathaway	10 00
		<u>\$2,024 40</u>

Disbursements.

Dec. 28.	Express on Tin Box from Indianapolis.....	\$1 40
	“ Diplomas from Indianapolis.....	60
	“ Tin Box to Boston.....	1 25
	“ Tin Box to Chicago.....	1 25
	“ Books to Chicago.....	65
	“ Stationery from Buffalo	75
	Telegram.....	50
	Stamps.....	2 00
	Telegrams.....	1 80
	Stamps.....	2 00
May 16.	Telegram.....	65
22.	Telegram.....	60
24.	Telegram.....	4 00
	Express on By-Laws to George Murphy.....	80
	Circular to Dunn & Co.....	23 00
	Stamps.....	1 25
Aug. 12.	Paid Treasurer.....	1,127 50
Sept. 3.	“.....	340 75
Dec. 3.	“.....	247 25
3.	“.....	264 40
		<u>\$2,024 40</u>

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A REGULAR meeting of the Society was held Wednesday evening, January 1, 1890, the *President*, FREDERICK GRAFF, in the chair.

The Secretary read a communication inviting entries to the exhibition of the Worcester-shire Camera Club at Kidderminster, Eng., to be held from March 1st to 15th. A prospectus accompanied the communication.

A letter was read from the New Orleans Camera Club, extending the use of their rooms to visiting members of the Philadelphia Society. The Secretary was authorized to acknowledge the invitation with thanks.

The annual report of the Treasurer was presented, showing a cash balance on hand of \$820.68.

The annual report of the Executive Committee was read, giving a *résumé* of the work of the Society for the past year. A number of valuable additions to the library had been made, and a considerable sum expended for

binding of journals, etc. Principally through the efforts of Dr. Ellerslie Wallace a complete catalogue of the library had been prepared, and was now ready for the printer.

Reference was made to various papers read before the Society, to the Third Annual Joint Exhibition held under the auspices of the Society during the month of April, and to the Fall Competitive Exhibition, now in progress, from which the Honor Pictures for 1889 would be selected.

The Committee on Membership reported the election of the following Active Members: Gustavus Cook, Alfred J. Kippelmann, Ewing L. Miller, Charles P. Sherman, and Henry Whiteley.

The Committee on Lantern Slides reported as follows: At the Conversational Meeting, held December 18th, the interchange slides shown were those of the Syracuse Camera Club. This organization was admitted to the American Lantern Slide Interchange only this year, and their first contribution was certainly creditable to the members of the club, and a

pleasure to the members of this Society who saw them. There were seventy-six slides in all, most of them on gelatine dry plates, and represented a wide stage of subjects, including some fine studies in Europe by J. M. Winter, Jr., Dr. Wasse and F. W. Marlow, and several views in the Rocky Mountains by C. E. Lippe. John R. Clancy's slide entitled "Anthony" pictured a superb lion, and the same gentleman showed several novel balloon views. Slides by Arthur Beebe, W. H. Olmsted, and Frederick Frazer were also worthy of special mention.

Dr. Charles L. Mitchell gave the members a treat by showing fifty excellent slides, on gelatine plates developed by eikonogen, from negatives by G. E. Essig, of this city. The views were chiefly marine studies, made with a Hawkeye Detective Camera, and the cloud effects in most of the views were exquisite. Some of the latter were most striking and unusual. Slides were also shown by Percy Marcellus, Frank S. Lewis and Edmund Stirling.

Your Committee beg leave to suggest to the Society the propriety of having a public exhibition of lantern slides, either during the coming month or in March. The Society's public lantern exhibition in 1889 was given during the Joint Exhibition in April, so that your Committee has nothing to report in that respect.

The suggestion in the report to hold an exhibition of lantern slides was brought up by Mr. Browne, who moved that the Committee be requested to arrange an exhibition of lantern slides at their early convenience. Carried.

The election for officers and committee for 1890 resulted as follows: *President*, Frederic Graff; *Vice-Presidents*, John G. Bullock, Joseph H. Burroughs; *Secretary*, Robert S. Redfield; *Treasurer*, Samuel M. Fox; *Executive Committee* (3 to be elected), Ellerslie Wallace, M.D., Charles L. Mitchell, M.D., Edmund Stirling; *Committee on Lantern Slides*, Edmund Stirling, Frank Bement, William H. Rau; *Committee on Excursion*, Samuel Sartain, John Carbutt, W. D. H. Wilson; *Committee on Membership*, Henry T. Coates, John Bartlett, George Vaux, Jr., David Pepper, Edward W. Keene, Joseph H. Burroughs, Charles L. Mitchell, M.D., Frank Bement, W. H. Walmsley; *Committee on Revision of Minutes and Articles for Publication*, John C. Browne, John G. Bullock, Robert S. Redfield.

The vote for the Honor Pictures for 1889 resulted in the selection of these four pictures:

No. 15. "Hesitation," by Robert S. Redfield.

No. 32. "A Fair Quakeress," by Clarence B. Moore.

No. 31. "A Wayside Spring," by Dr. Charles L. Mitchell.

No. 36. "Making Friends," by Robert S. Redfield.

A paper prepared by Dr. Charles L. Mitchell and Mr. John G. Bullock on the "Dangers of Flash-Light Compounds," was read by Mr. Bullock (see page 71).

Adjourned.

ROBERT S. REDFIELD,
Secretary.

DETROIT AMATEUR PHOTOGRAPHIC SOCIETY.

ON Tuesday evening, January 14th, the members of Detroit's new organization of amateur photographers had a formal public opening of their apartments on the north side of State street, just west of Rowland street. The rooms are on the third floor and consist of an assembly room of liberal dimensions, a room for printing, a room for lockers and the storing of individual cameras, chemicals and the like, a room for special experiments and developing rooms. The experimenting rooms and developing rooms are provided with water and electric lights, the printing room is fitted with appliances for ordinary printing and for making solar print enlargements, and in brief the entire establishment, while unpretentious, is convenient and complete in its provisions for the purposes of the club. It is the intention of the club to have lectures and exhibitions by noted amateurs, both from abroad and at home, in which special experiments and all new revelations in the science of photography will be elucidated, and where, also, by a system of exchanging lantern plates now practiced by the many organizations of amateur photographers throughout the country, it will be possible to give frequent and very interesting exhibitions of photographs, varied and comprehensive in character.

The assembly room of the club was occupied by one hundred and fifty chairs, and not only was either a lady or gentleman in each chair, but every inch of standing room, even out into the hallway, was occupied. Bryant Walker began the evening's entertainment by briefly outlining the aims and purposes of the club, after which he pleasantly called attention to the fact that if one of the philosophers of ancient times could be asked to-day as to

the present greatest seven wonders of the world he would probably give photography a place very near the head of the seven. It is not so very many years ago that the man who had his picture taken was obliged to chalk his face and stand or sit perfectly still for at least half an hour; to-day the man who might not wish to see his features in picture cannot move fast enough to escape the magic of the dry plate and the diablerie of the snap-shot. With possibly the exception of steam and electricity there is no science in which greater advancement has been made than in the science of photography, and, too, no science has proved of greater practical value to the world at large. This advancement is somewhat recent in its character, as the present wondrous popularity of photography as an intellectual entertainment only dates from the advent of dry plates and snap-shot appliances. Strange, too, as it may seem, the amateur camera crank is proving a benefit rather than an obstruction to the studious, skillful professional photographer.

Mr. Walker's remarks were attentively listened to and were received with applause, after which Frederick Joy, President of the club, entertained the audience for half an hour or more with a series of very fine photographic views—all taken by members of the club—enlarged and thrown upon a screen at one end of the hall. Mr. Joy displayed much skill as the manipulator of the lantern and its dissolving views, sharing the honors of the evening with Mr. Walker.

LYNN CAMERA CLUB.

THE event of Thursday evening, January 23d, was the dedication of the club house, at 42 Broad street. At an early hour in the evening the rooms were illuminated, and by 9 o'clock they were comfortably filled. On the first floor is the banquet hall, and in this Professor Thomson, of the Thomson-Houston Company, made a fine display with his prints, the views being all foreign.

In the large drawing room, on the second floor, the exhibition of prints was large and interesting. Fred. Bramhall showed views from Madeira; E. F. Bacheller had a large number of Lynn fire views; those shown by J. Darcy represented mountain and Lake George scenes, taken while on vacation. He also displayed Lynn views. Dr. Williams had in his display many scenes from California; and W. H. Russell's exhibition comprised many yachting scenes and New York

views. One print in particular which attracted more than ordinary attention was a view of the flagship Chicago, taken on November 26th, at 12.50 P.M., as she lay in Boston harbor. The smoke from the Lynn fire can be plainly seen in the distance. William B. Gifford showed many pretty country views, taken on his vacation, and Joseph N. Smith has a good exhibition of miscellaneous views and some taken in Quebec. Mrs. Jennette Appleton, one of the lady members of the club, made a grand display of work from the camera, having done some extensive traveling through Essex County, and her scenes of Manchester-by-the-Sea are beautiful. Mr. Bacheller and H. C. Hovey also made fine displays of Lynn views, Mr. Hovey's fire scenes being extra fine.

An interesting feature of this establishment is the dark room, where the work on the negatives is carried on. The club-house is one of the finest in the State, and the members may well feel proud of their new home. Among the most prominent people noticed in the gathering were Professor Elihu Thomson, Benjamin Dore, Dr. Goodale, Billy Borne, of C. H. Codman & Co., Boston; Mr. and Mrs. Frank Keene, Mr. and Mrs. J. N. Smith, Mr. and Mrs. L. B. Russell, Reynold Sutherland, F. W. Breed and family, Dr. Thompson, Miss Hastings, of Brooklyn, N. Y.; Mrs. Harry Fuller, Charles Burrows, Fred. Bramhall and lady, Charles Todd, J. Frank Perry, Rev. W. H. Burbank, of the American Amateur Photographer; S. C. Tozzer, Miss Gertrude Townsend, J. W. Darcy and Nathaniel Bachellor.

The club gave a most successful exhibition of lantern slides at their new club house, No. 42 Broad street, January 29th.

Being members of the New England Lantern Slide Exchange, they received an installment of eighty-nine slides from the Boston Camera Club.

There were about one hundred and forty present, and every one was high in their praise of the excellent views shown. Mr. Drew, the President of the club, managed the lantern, and Mr. Bacheller handled the slides.

Among the most prominent views shown, and the ones which received the most attention and praise were the following:

Mr. Latimer had several excellent slides, among them being "A River Road in Palatka, Florida," "Moonrise on the Water," "Street View in Monterey, Cal.," this last view showing very fine cloud effects.

Mr. Blake, of telephone fame, showed among other views, one of a railway train going at the rate of forty-eight miles an hour, the time of exposure being only .003 of a second. The work was very sharp and clear.

Mr. Plimpton had a slide representing two boys in a swing, when they were at the highest point, which was very fine.

Mr. Reed had a series of slides representing a toboggan slide. One at the top, one at the bottom, and another about three-quarters of the distance down, and the last one was entitled "Walkee Back a Milee." This one created considerable amusement.

Mr. Blake also showed an excellent view of a panel in a library mantel, which displayed very fine carved work.

Mr. Van Nostrand's exhibit was very fine, consisting of surf and yacht scenes which showed excellent work.

Mr. Briggs had a very excellent one entitled "Where the Boughs Meet."

The last one which was shown was called, "We are Tired Out—Good Night," and it represented two fellows in bed just pulling the clothing over their heads.

February 4th the club expect to have a series of slides from the Providence Camera Club, giving Narragansett Bay views. The following new names have been proposed for membership, and will be acted upon at the next meeting:

F. W. Breed, M. M. Packer, George S. Bliss, L. B. Russell, Dr. Goodale, W. T. Bowers, Frank W. Makepeace, Fred. Bramhall, W. H. Godfrey.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—W. J. H. encloses a small cabinet view and writes: Please find view which I send to get your opinion of. What do you think of it? I took it in the month of July, and would like to know what you think of the posing.

A.—It is very picturesque, but it appears to us that the line from the fisher's rod has been retouched too much; it looks unnaturally thick. The posing is excellent and artistic.

Q.—T. H. E. encloses cabinet of baby sit-

ting upon a fur rug, made from the skin of a fox, with head towards foreground, and writes: I think the picture fair, but, wishing to improve in my work, would be very much pleased to receive your criticism and suggestions through the BULLETIN.

A.—The negative work and the printing are excellent, but the sharpness of the head of the fox and the child is in such strong contrast to the bad definition of the more distant parts of the rug that the artistic effect is marred. Try using a smaller stop and focus upon a point a little further back, and we think the picture will be very much improved.

Q.—W. M. F. sends cabinet three-quarter picture of lady in Greek costume, and writes: Please make comments.

A.—The posing and lighting are excellent, and the only fault we can find with the work is that the right forearm, resting on the cushion or drapery, is given a thin and unnatural look, owing to the crowding of the fabric around it.

Q.—Hipo writes: Will you give us a good, simple and sure test for hyposulphite of soda in our water in which the prints are soaked?

A.—Boil 1 ounce of water, and, when boiling, throw into it a little cream of starch, made by mixing starch with a very little cold water; boil up once, and then *cool thoroughly*. Now add to the starch paste so made one or two drops of tincture of iodine, and dilute it with water until you have a pale blue fluid, say sky blue. To a small quantity of this fluid add some of your wash water; if it bleaches out the blue color, it contains hypo.

Q.—G. H. T., enclosing prints with numerous small dark spots, writes: Will you please tell me the cause of the spots on enclosed prints? I used a new bath, 60 grs., floated two minutes, and fumed thirty minutes. I am a printer, but never had any experience of this kind before.

A.—We believe these spots are due to pyro dust upon the surface of the paper before floating. Paper should always be rubbed with a tuft of clean cotton before floating.

CITIZEN—"Here, cab!"

Cabman (looking at him critically)—"Is it a reception, sir?"

Citizen (angrily)—"What difference does that make to you?"

Cabman—"All the difference in the world, sir. You're in full dress. If it's a reception it's all right. If it's suicide you pay in advance, sir."

Views Caught with the Drop Shutter.

WE regret to learn that STUBER BROS., the well-known and enterprising photographers of Louisville, suffered a loss of \$5,000 from a fire in their studio, 532 4th street, on January 19th last. The loss was partially covered by insurance, and in a short time they will be in good working order again.

THE following, taken from the New York *Sun*, January 29th, may interest our readers: "The *Daily Graphic*, which was born on March 4, 1873, and which, in its sixteen years of existence, had many ups and downs, was decently buried yesterday by Edward Pettinger, the auctioneer. The *Graphic* expired last November, and the entire plant sold for \$5,000. Yesterday the lithographic and photo-engraving establishments of the paper, the presses, and everything in the pictorial line were knocked down to the highest bidder and taken away.

Nothing in the composing and editorial rooms or in the business office was sold, and it is said that a new daily afternoon Republican newspaper, to be called the *Republic*, will shortly be started in the building by R. A. Corrigan, who was formerly connected with the *Kansas City Globe*. The new paper will not be illustrated. A large quantity of lithographic stones, many bound volumes of illustrated newspapers, and a great number of pen-and-ink drawings were sold, and, from an auctioneer's standpoint, they brought rattling good prices. About the most interesting lot sold were about five thousand original pen-

and-ink drawings by A. B. Frost, Thurlstrup, W. A. Rogers, C. J. Taylor, Philip G. Cusachs, E. W. Kemble, E. J. Meeker, Fernando Miranda, Grey Parker, C. D. Welden, F. S. Church, Walter Shirlaw, and others. The entire lot brought only \$37.50. They had cost the *Graphic* something like \$30,000.

An old-style enlarging camera brought \$5. It was all that remained of \$10,000 worth of cameras and lenses which were purchased when the paper first started. The others had melted mysteriously away under the changing managements of the unfortunate *Graphic*. Of the library only some bound volumes of newspapers and some loose engravings were left. The others had disappeared.

The *Graphic* was started on the day of Gen. Grant's second inauguration, and the principal picture represented troops marching in Washington to attend the inaugural ceremonies. The founders of the newspaper put \$750,000 into the enterprise and for a while the establishment made money. They had the most complete photo-engraving and lithographic plant in the country. They did all the lithographic work for the United States Patent Office, and published all the hydrographic maps for the Government. For seven years they printed all the internal revenue stamps, and did an enormous business, the revenue from the stamp department alone netting about \$100,000 a year. Disagreements among the stockholders and loose management finally succeeded in wrecking the establishment, and with the final fall of the auctioneer's hammer yesterday the *Daily Graphic* was a thing of the past.

About \$11,000 was realized by the sale.

WE regret to have to record the death of Mr. A. L. BUTLER, the photographic merchant, of Hartford, Conn.

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MADE WITH RAPID ARISTOSCOPE LENS.

PRINTED ON N. P. A. EXTRA BRILLIANT ALBUMEN PAPER.

LANDSCAPE STUDY, BY

J. R. HUSSON.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

FEBRUARY 22, 1890.

Vol. XXI.—No. 4.

STAINED NEGATIVES.

THE production of a good positive or print depends so much upon the character of the negative from which it is made that we might almost set it down as an axiom ; given, a good negative, a good print is easy of production, and only carelessness on the part of the printer will lead to an inferior result.

Of all the sources of trouble with negatives, those due to stains of various kinds are the most difficult to overcome. Gelatine, the basis of modern dry plate photography, is one of those animal products that very readily unites with coloring matters. This fact has been known to the dyer for a long time, and he uses material of a similar character in order to fix his colors upon fabrics that otherwise would not take and hold the dye-stuffs that he uses. In a word, gelatine makes a good mordant for many coloring matters, especially those of organic origin. The union of the color with the gelatine is made still more permanent from the fact that the gelatine is rendered insoluble by the action of light in conjunction with the silver salts that form the negative image. This latter result is also intensified when chrome alum is used in the manufacture of the dry plate in order to prevent frilling. We, therefore, have a very difficult problem in hand when we attempt to remove stains from gelatine negatives, since these discolorations are due to a union of the coloring matter with insoluble gelatine, and a removal of them completely is about equal to the destruction of the gelatine itself. Of course, prevention is better than cure in this case, as well as in many others.

In order to study the character of the various stains and allied defects in negatives, it is well to arrange them according to their origin. First, we have stains due to the action of various materials upon the plate before it goes into the developer. With beginners the most common of these are finger marks. These come from the careless handling of the plates before they are placed in the holders, and are generally recognized by their form. There is no way to remove them, as they are due to the excessive reduction of silver salt where the perspiration of the skin has adhered, and which produces local reduction of metallic silver during the action of the developer. Here is a case where prevention only is the remedy. Don't touch the face of the dry plate under any circumstances before placing it in

the plate-holder. It may sound unnecessary to call attention to this particular source of trouble ; but we have seen so many stains due to this cause, and in cases too where the photographer declared that he was extremely careful, that we cannot refrain from mentioning the matter at this time. With film negatives it is very easy to have shaded markings due to thumb and finger impressions in handling the film when placing in the holders.

Yet another class of stains come during the process of development, and these are more difficult to either prevent or remedy. With pyrogallol and hydroquinone, there is a very disagreeable yellow or brownish stain due to the use of excessive alkali or prolonged development. Negatives stained in this manner are excessively troublesome to the printer, and never give satisfactory positives. With hydroquinone it appears next to impossible to entirely get rid of this coloration. A very great improvement is obtained by soaking in a 10 per cent. bath of acid sodium sulphite for some hours, and before fixing; this bath can be made by dissolving two ounces of sulphite of sodium crystals in ten ounces of water and then adding one-third of an ounce of concentrated sulphuric acid. With pyrogallol the stained negative can be very completely cleared by using an acid alum bath made by dissolving one ounce of alum crystals in sixteen ounces of water and adding one fluid dram of concentrated hydrochloric acid. The acid in this latter bath is the clearing agent, the alum preventing frilling ; it is therefore necessary to test the bath from time to time to see that it is still strongly acid. The bath should be used after developing and before fixing, consequently it is best to wash the negative before placing it in the clearing bath in order that the latter may not become neutralized by the alkali carried from the developer.

Hydroquinone stains may be sometimes removed by placing the negative, after fixing and thoroughly washing, in a solution of hydrogen peroxide (the commercial product) containing enough ammonia to make it just alkaline to red litmus paper. They may have to stay in this bath several days to obliterate the deeper stains. Another bath that is quite serviceable is to mix six volumes of hydrochloric acid with one volume of nitric acid, and allow the mixture to stand several days in a warm place (77 degrees Fahr.). When required for use the acid mixture is diluted with twelve volumes of water and the negative immersed in it until the desired clearing effect is obtained. This latter bath often acts very rapidly, especially with yellow stains. After clearing the negatives are thoroughly washed in running water.

Another class of stains on negatives come from imperfect fixing, and grow stronger with age. These are caused by the removal of the negative from the fixing bath before the complete solution of the undecomposed silver bromide has been effected. They may also come from using a fixing bath that is slow and nearly saturated with silver bromide. The best plan is to guard against their formation by using two fixing baths, one to fix with in the ordinary way, and a second one to place the negative in after it is apparently well fixed in the first bath. Thorough washing of the negative is also necessary to prevent the formation of these stains. They are frequently called hypo stains, but they are really due to the decomposition of the double salt of silver and hyposulphite of soda which is formed in the fixing operation. This double salt gradually decomposes under the influence of light and stains the negative yellow, or even brown in bad cases, from the formation of silver sulphide in the gelatine film. There is no method of eliminating these stains after they are once formed, and

they become stronger as the negatives grow older, according to the extent of the defect in the original work.

Negatives may also be stained in the hands of the printer, by contact of the silver paper with the damp gelatine films. In this latter case, if the stain is a new one, it may be removed by rubbing the negative with a dilute solution of potassium cyanide upon a tuft of cotton, care being taken not to continue the action too long, as the image may also be dissolved. The strength of the solution should be regulated to the depth and age of the stain. These stains may be known by their reddish color.

From what we have said, it is evident that by far the greater number of stains upon negatives are the result of faults in manipulation; but occasionally they come from accidents, and the remedies we have given will be found useful, especially if the negatives are valuable and cannot be readily duplicated.

Careful manipulations and a strict following of the directions given for the development and fixing of the plates will give negatives free from stain.

EDITORIAL NOTES.

OUR English friends have again suffered from the explosion of a gas cylinder used for holding oxygen for lantern exhibitions. At Polmadie, near Glasgow, a cylinder filled with oxygen under a pressure of 3,600 (!) pounds to the square inch exploded while being handled in shipment, and injured Mr. William Bow, the foreman of the Scotch and Irish Oxygen Works, so that he died two and a half hours after the occurrence. He was thirty-five years of age, and leaves a wife and young family to mourn his loss. We have on a former occasion entered our protest against filling these cylinders to such an enormous pressure. If the figures quoted above are correct we must call the practice diabolical. Unless it is in a steel gun, we know of no case where a reservoir carrying gas or air pressure has been loaded to such an extent. And we promise our transatlantic cousins that they will continue to have such accidents unless they reduce the pressure of the gas in cylinders that are used for such purposes. From years of experience here in the United States it has been found that pressures below 300 pounds on the square inch are adequate for all purposes of exhibition of lantern slides.

THE Newark Camera Club held its annual dinner at Munzer's restaurant, Newark, on February 6th. Thirty-two members participated, and had a very enjoyable time. The menu was illustrated with photographic and pen-and-ink sketches, the work of Messrs. Hine & Edwards.

THE exhibition of lantern slides and concert given by the Society of Amateur Photographers of New York, in Chickering Hall, was a very pleasant and successful entertainment. Among the slides exhibited were the work of Ernest Warrin, C. C. Roumage, C. G. Hine, F. Ruppert, H. Sidman, C. S. McKune, W. M. Murray, H. M. Grisdale, James H. Stebbins, Jr., Robert A. P. Dayton, A. L. Simpson, Miss Catharine Weed Barnes and others—in all twenty-three members of the society being represented in the exhibition of "Picturesque New York." The concert consisted of vocal and instrumental music by a number of artists, and the second lantern exhibit embraced the slides of the "Paris Exhibition" captured by Mr. A. L. Simpson with a camera concealed in a wicker lunch basket, and without the consent of the authorities. They were all remarkably good.

ON Tuesday evening, February 11th, Dr. L. H. Laudy gave an illustrated lecture at the School of Mines, Columbia College, upon the subject of "Photomicrography." Those of our readers who failed to attend certainly missed seeing some of the best pieces of work of this kind that have ever been executed. Dr. Laudy's skill as a photographer, combined with his successful adaptation of the microscope to photographic work, have given him results hitherto unattained in this field of applied science. It is useless of attempt to describe these results; they must be seen to be appreciated.

WE are indebted to the Entertainment Committee of the Boston Camera Club for an invitation to the illustrated lecture, "The White Mountains," held February 21, at Union Hall, Boston. We regret that time and space prevent our attendance at this delightful entertainment, but we heartily thank the club for its kind thought, nevertheless. The slides that illustrate the lecture are from negatives by Messrs. Ames, Blake, Briggs, Bullock, Curtiss, Dusseault, Jenney, Latimer, Pond and Reed, members of the club.

WE are requested by Mr. G. H. Hastings, of the Photographers' Association of America, to announce that due notice will be given through the journals and circulars, as soon as possible, in regard to the hall to be used for the Convention at Washington, in August next. It is hoped that a part of one of the Government buildings may be secured, and if this is accomplished, we are sure all members will be well satisfied.

OUR publishers recently handed to us a diploma just received from the authorities of the Paris Exhibition of 1889, and awarded to an exhibit of volumes of the BULLETIN and "International Annual" which we sent over last summer. It is a very handsome piece of work and shows that our efforts are appreciated across the water.

MR. W. JEROME HARRISON, the English Editor of the "International Annual," has been awarded the proceeds of the Barlow-Jameson Fund, "in recognition of his valuable contributions to geological science." This award is made by the Geological Society of Great Britain every two or three years, and the former recipients were Dr. James Croll, Baron von Ettingshausen, Professor Leo Lesquereux and Dr. Johnston Lavis. We must congratulate Mr. Harrison on this well-deserved honor conferred upon him, for he is as well-known as a geologist as he is in the ranks of photographers. It is not often that a scientist becomes so distinguished in two such important branches of knowledge.

RICHARD KIMBALL, the son of W. G. C. Kimball, the well-known photographer of Concord, New Hampshire, sailed from New York in the steamer "Lahn," for Bremen, *en route* for Vienna, where he intends to study photography under the guidance of Professor J. M. Eder, in the Imperial Institute. It seems strange that a young American should have to go so far to obtain the high grade of knowledge now necessary to successfully pursue the art of photography; and we hope the day is not far distant when institutions of learning in the United States will see that they are expected to furnish a similar course of higher instruction in our art.

THE Old Colony Camera Club, of Rockland, Mass., was reorganized February 1st, with the following officers: *President*, Daniel Smith; *Vice-President*, Fred. Ames; *Secretary*, H. W. Studley.

MR. H. McMICHAEL, of Buffalo, writes us that by some mistake the name of Mr. John Carbutt was left out of the Philadelphia Committee upon the Daguerre Fund, and asks us to add it to the names already given in the last number of the BULLETIN.

BRIDGETON, N. J., has a new amateur photographic association called the "Camera Society of Bridgeton." The following are the officers: *President*, Henry A. Janvier; *Vice-President*, Fred. F. Smith; *Treasurer*, George Hampton; *Secretary*, Hugh L. Reeves. It consists of fifteen members, organized in January, 1890, and they have rooms at No. 48 Commerce street. Meeting nights first Tuesday of each month.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Water Lichtdruck Process—Magnesium Flash Light—Police and Jury—New Magnesium Flash Light—The Grammophone and Photography—Restoring Yellow Albumen Prints—Yellow Fog on Dry Plates.

IN my letter, published December 28th, page 743, I mentioned Husnik's water Lichtdruck process. This process is a curious one. The Lichtdruck process is based upon the principle that a gelatine chromated film becomes insoluble in water by the action of light, but obtains the capability of absorbing fatty ink. If, therefore, a chrome gelatine film is copied under a negative, the parts through which the light can penetrate will absorb fatty ink, whereas the parts on which the light has not acted will not absorb ink. They remain, however, pervious to water, *e. g.*, for water-colors.

If, therefore, a copy has been made under a positive, and the film is rolled with water-color, this will adhere to the parts which were not acted on by light. This is the principle of the water Lichtdruck process. This has not yet been applied practically as far as I know.

In my last letter I wrote to you about the new magnesium blitz studio. Such a one has now been fitted up at the headquarters of our police to take the portraits of criminals instantaneously. They are taken to this studio, which has the appearance of an ordinary room, and asked to take a seat. Before they are aware of it the proper focus is taken, the magnesium flashes, and their pictures are ready to adorn the album for criminals.

A still more extensive application of photography in the judiciary department is intended to be made.

The many murder cases which have occurred lately point to the necessity of photographing the locality where the murder took place. These photographic pictures are to give not only a true description of the locality, but to reproduce the original position of the corpse, etc., as far as obtainable. They should be made in sufficient numbers to serve at the preliminary investigation as well as during the jury trial, and be handy to judge, jury, experts and defense. This arrangement would furnish the most correct proof, as such representations would

facilitate very much the comprehension of the records and the testimony of witnesses, while otherwise incorrect ideas as to position and locality might often be formed. The photographic pictures seem to be of particular advantage to the jury, who, with their aid, are much better enabled to follow the proceedings. It might, therefore, be recommended to take views of external wounds which are discovered on the corpse for the better understanding of medical experts. If photography is introduced for the purpose above mentioned, it would have to be applied the same as in railroad accidents and conflagrations. Wherever such a photograph could be handed to the jury, it would simplify the proceedings considerably, as a good many questions might be avoided thereby. The photographic picture would also be of particular advantage in complicated lawsuits.

That the magnesium light is here of importance for views of dark interiors need hardly be questioned. The latest now is the simplifying of the magnesium lamps, so that any common oil lamp can be easily arranged to serve as a magnesium flash-light.

This has been accomplished by the "Fulgur Apparatus" of Dr. Leonhard.* This new flash arrangement is such that it can be attached to any lamp with a chimney, and that here the magnesium is not blown by a cooling forced air pressure into the lamp in the direction of the escaping gas from the lamp, but on the contrary, in an opposite direction, and is thrown in by a mechanical appliance. The magnesium is completely burned up with an intense flame. No unburned magnesium powder can fill the air. Black spots on silvered paper are oftentimes caused by the magnesium powder.

The arrangement consists of a kind of sling, fastened by means of a spring and pneumatic release, and can be attached to the upper end of any oil lamp or gas burner chimney. If several flashes are to be produced at the same time (in groups for instance), the several lamps containing the arrangement are connected with tubing and bulb. Thus all the lights of a large chandelier can be set off with a single pressure for an instantaneous flash.

The apparatus may remain on the lamp for hours before and after use without the slightest injury. As the burnt magnesium will only adhere to the inside of the chimney as an easily removable dust, one is enabled to take photographs at any time of the day or night in the most luxuriously fitted up salons without the least disturbance to the occupants.

The flashes produced in oil lamps are not so powerful as those from gas burners. Still two oil lamps are sufficient to produce a single portrait, just as good in every respect as one taken by daylight, and they can hardly be distinguished from each other.

It may be mentioned here expressly that it is of no advantage to use too large a quantity of the powder. A few centigrams are sufficient.

To photograph by magnesium light, not too large a room with light walls is the most suitable, saving considerable light in such a place. Portraits of one or two persons can be well exposed with two or three oil lamps or one or two gas lamps, even with a not very rapid objective. Both lamps should be placed on the light side, about $\frac{1}{2}$ m. above the height of the eyes, at a distance of $1\frac{1}{2}$ m. for bust pictures, and for two-thirds or full figures a little further off, so that objective, object and lamp form an angle of about 45 degrees. The shadow side is lit up by a white screen, to be placed at more or less distance from the

* A cut of this apparatus will appear in the next BULLETIN.—EDITORS.

object. In this way all light effects can be obtained easily, for instance, by placing the lamp near by an illumination of plastic effect can be had. An attentive operator can easily regulate the effect of his illumination by the previous picture.

For groups, four or more lamps should be employed, according to the size and condition of the room and the number of persons. They are divided in about the following proportion : With four lamps—three on the light side and one on the shadow side, all about $\frac{1}{2}$ m. above the eyes, the distance to be in proportion of how much of the object is to be taken. If the lamps are so placed that no direct light will fall into the objective, then the holder and objective may be opened without the slightest danger of fogging the plate, and, bulb in hand, the suitable moment may be waited for, when the picture is taken. I have observed, oftentimes, how a jovial party was taken at night with this “fulgur” apparatus, using the same lamp that served to light the room. The mirror, hanging on the chimney, protects the objective from directly penetrating light.

Everybody knows Edison's phonograph. This has now a competitor in the grammophone of Jacob Berliner, which admits the application of photography.

The grammophone reproduces the sound—the human voice as well as music—faithfully, but not always without a disturbing noise. The grammophone is particularly successful in the reproduction of pieces of music of several instruments, which are rendered with an almost faultless expression. In Berliner's grammophone the wax-cylinder of the Edison phonograph is replaced by a zinc plate, covered with some protecting coating, into which a print, fastened by a membrane, draws undulating lines corresponding with the vibrations of the membrane, which is set in motion by the undulating sound.

These metal plates are then treated with acids like etchings, and one obtains therewith an imperishable plate, which can be multiplied at pleasure by the galvano-plastic process ; yes, it is even possible to make enlarged photographic copies from the original plate, from which new and larger plates of correspondingly stronger sound can be produced. The sound-funnel arrangement of the grammophone, by which the tunes can be so increased that a greater number of people can hear it at the same time, has been more successful than the arrangement with which Edison tried to attain the same effect.

At the last meeting of our society several questions were asked, which might also be of interest to foreign readers. They are the following : Is there an effective intensifier for yellow albumen prints, and what is the treatment?

According to Davanne, the picture is removed from the cardboard by soaking in water ; it is then plunged into a neutral gold bath with 0.2 to 0.5 chloride of gold and potassium to 100 parts of water, left therein until it has assumed the desired tone, washed in a partly dark room, and is fixed again. We have not obtained very satisfactory results with this method.

How is a heavy yellow fog on the erythrosin bath plate to be removed or to be avoided?

Yellow fog on erythrosin, or erythrosin silver bath plates has never happened to us. If the pyro developer should be the cause of the yellow fog, it can be removed easily by bathing the plate in aqueous sulphurous acid. A solution of sulphite of soda (10 per cent.), to which is added muriatic acid or diluted sulphuric acid until it smells strongly of sulphurous oxide, acts just as good. Another kind of yellow fog, which, if looked at sideways, shows a metallic gloss, forms easily if the developer has been contaminated with fixing

soda. The latter dissolves small quantities of bromide of silver, which, being reduced by the developer to metallic silver, settles in the gelatine film. This fog can sometimes be removed from the moist plate by careful rubbing with the fingers or a cotton tuft. Both kinds of fog appear just as much on ordinary as on color sensitive plates.

BERLIN, January, 1890.

THE CHEMISTRY OF URANIUM AND ITS SALTS AND THEIR BEHAVIOR IN PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

URANIUM, U.

THE most important ores of uranium are pitchblende, in which it occurs as the black oxide united to silicon, iron, lead, etc., and uranite, which is a phosphate of uranium and copper. The latter is employed to tinge glass green-yellow, which then exhibits a similar fluorescence; while the former is used to color porcelain and glass black.

Uranium is isolated by progressively heating in a platinum crucible the uranous chloride with sodium. It is of an iron-gray color, hard, little ductile and oxidizing in the air. It does not decompose water at ordinary temperatures. At a red heat it becomes covered with a coating of black oxide, and at 395° C. it burns, being converted into the green oxide.

It unites directly to bromine, iodine and sulphur with great energy, and to chlorine with evolution of heat and light, uranous chloride being formed.

Uranium dissolves in acids, liberating hydrogen and forming uranous salts. However, nitric acid transforms it into uranic nitrate and oxidizes all its salts of lower oxidation.

It gives rise to two classes of compounds characterized by their color, viz., *the green*, or uranous salts, in which it is diatomic, and *the yellow*, or uranic salts, containing the radicle (U_2O_2), which acts diatomic.

COMPOUNDS OF URANIUM WITH THE HALOIDS.

Uranous chloride, UCl_2 . This chloride is deliquescent, evolves fumes in the air, and produces a hissing sound while dissolving in water. Its solution is green, stable at ordinary temperatures, and decomposed by boiling.

It is prepared by passing chlorine over a mixture of uranous oxide and charcoal heated in a glass tube.

Uranous chloride possesses energetic deoxidizing properties. It reduces instantly the salts of silver, gold and platinum, and converts the ferric salts into ferrous salts. These actions are common to all the uranous salts.

Uranic or uranyl chloride (U_2O_2) Cl_2 , is prepared by the action of chlorine on uranous oxide heated red hot. It condenses in yellow needles soluble in water, and forms double salts with the alkaline chlorides.

The bromides of uranium, UBr_2 and (U_2O_2) Br_2 , are similar to the chlorides in their properties.

Uranous iodide, UI_2 , is the only known compound of iodine with uranium. It is unstable. It turns brown in the air, leaving a residue of uranic oxide.

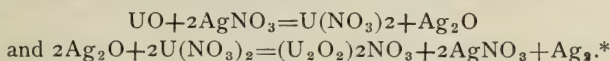
OXIDES OF URANIUM.

Uranous oxide, UO . Anhydrous uranous oxide is obtained by passing a current of dry hydrogen over the double chloride of uranyl and potassium

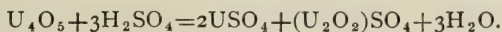
heated to redness in a glass tube and dissolving the potassic chloride in water. It is a red-brown powder, insoluble in dilute acids, nitric acid excepted.

The hydrate is prepared by precipitating uranous chloride with aqueous ammonia. It is yellowish brown, and forms green salts with acids, with the exception of nitric acid which, as before stated, oxidizes all the compounds of uranium.

Uranous oxide is very unstable, having a great affinity for oxygen. It reduces the salts of the noble metals. In its action on silver nitrate a double decomposition first occurs. Uranium displaces the acid radicle (NO_3) from the silver salt, while the metallic silver and oxygen liberated unite to form argentic oxide. Then another change takes place—the uranous nitrate formed oxidizes at the expense of the silver oxide, setting the silver free, thus :



Uranium black oxide U_4O_5 . This oxide is considered as a compound of uranous and uranic oxide $(\text{UO})_2\text{U}_2\text{O}_3 = \text{U}_4\text{O}_5$. It is stable in the air at ordinary temperatures and decomposes only at a red heat into green oxide. It does not unite bodily with acids, but gives rise to uranous and uranic compounds ; thus :



Uranoso-uranic oxide (green oxide) $\text{U}_3\text{O}_4 = \text{UO} \cdot \text{U}_2\text{O}_3$. When a solution of uranic oxalate is exposed to the action of the solar light it soon becomes turbid and deposits a substance of a brown violet color. Carbon dioxide and carbon monoxide are evolved, and, if the oxalate be pure, the liquid becomes colorless and the violet precipitate commences to turn yellow. Then the liquid does not contain anything ; all the oxalic acid has disappeared. The precipitate exposed to the air until quite dry is rapidly converted into a light yellow matter which is the hydrate of uranic oxide.†

The precipitate is the uranoso-uranic oxide, U_3O_4 , which is brown at the moment of its formation, but which afterwards becomes greenish. To isolate it, it should be collected before all the oxalate is reduced, in order to obtain it free from uranic hydrate. The chemical changes are represented in the following equation :



The green oxide can also be obtained by heating uranous oxide in the air. It dissolves without alteration in concentrated hydrochloric and sulphuric acids. The dilute acids attack it with difficulty, forming uranous and uranic compounds. Nitric acid oxidizes it to uranic nitrate.

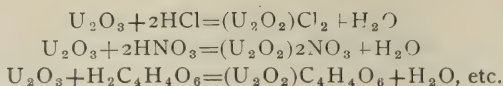
Uranic oxide or uranyl oxide U_2O_3 . Uranic oxide is obtained anhydrous by the calcination of uranic nitrate on an oil bath heated to 249 degrees C. The hydrate is formed by the oxidation in the light of the uranoso-uranic hydrate, prepared as stated above from the reduction of uranic oxalate.

Uranic oxide is a yellow powder insoluble in water, stable in the air, and transformed by heat into the black or green oxides. It possesses both basic and acid properties. With acids it behaves in an anomalous manner ; thus, while all the oxides having a similar constitution, M_2O_3 —vanadic oxide excepted—exchange all their oxygen for acid radicles, it only parts with one atom of it and

*Isambert. Compt. rend. vol. lxxx, p. 1037.

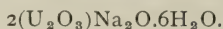
†Ebelman. Ann chim. phys. (3) vol v, p. 198.

the other two remain united to the metal as shown by the equations following:



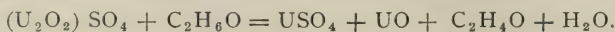
To explain these exceptional actions one considers U_2O_3 as the oxide of a compound radicle, U_2O_2 , acting as a diatomic element $(\text{U}_2\text{O}_2)\text{O}$. This radicle was termed uranyl by Pélégot, who isolated the metal in 1840 and studied its properties.*

The combinations of uranyl oxide with bases are named uranates. They are known in commerce as uranium yellow, and serve to glaze porcelain with a fluorescent green-yellow color. The sodium compound is represented thus:



SULPHATES OF URANIUM.

Uranous sulphate USO_4 . It is the product of the reduction by light of the uranic sulphate in solution in alcohol, which is transformed into aldehyde.



A compound containing four molecules of water is obtained by dissolving the green oxide, U_3O_4 , in dilute sulphuric acid, whereby uranous and uranic sulphate are formed. The former, being insoluble, is separated by filtration.

Uranous sulphate is soluble in hydrochloric and sulphuric acid, and decomposed by water into a basic sulphate which light oxidizes. It possesses reducing properties like all the uranous compounds.

Uranic sulphate—Sulphate of uranyl (U_2O_2) , SO_4 , $3\text{H}_2\text{O}$. It is prepared by dissolving uranic oxide in sulphuric acid. It dissolves in twice its weight of water and in alcohol. As stated above, it is reduced in solution in the latter liquid into uranous sulphate which in the dark oxidizes in an open vial into the yellow salt by absorption of the atmospheric oxygen. This action equally occurs with all the uranyl salts reduced by light, whether in solution or in presence of organic substance. This, in photography, explains the evanescence of the luminous impression by time.

NITRATES OF URANIUM.

The uranous nitrate has not been isolated owing to its extreme instability. It is only produced by the action of light, nitric acid oxidizing uranium and its oxides to the maximum.

Uranic nitrate—Nitrate of uranyl (U_2O_2) , 2NO_3 , $6\text{H}_2\text{O}$, is soluble in alcohol, ether and twice its weight of water. In alcoholic and ethereal solutions it is reduced by light. Its preparation is easy and needs no comment.

In presence of organic matters—starch, gelatine, albumen—light rapidly converts it into uranous oxide and uranous nitrate, a very oxidizable salt, possessing, therefore, energetic reducing properties.

Uranyl nitrate is generally acid. It should be neutralized when used in photography, for an excess of acid tends to oxidize the uranous salt as it forms, and consequently to lessen or to prevent the luminous action. It must be preserved in the dark and in a well corked vial. The reason is obvious.

* Ann. Chim. Phys. (3) Vol. V, p. 5 *et seq.*, and Vol. xii, p. 462.

THE EYES IN FLASH-LIGHT PHOTOGRAPHS.

BY W. E. PARTRIDGE.

LIKE most amateurs, I have tried the flash-light. Have tried it in almost every form. But the eyes were not often perfect. Too often the eyelids fluttered to an extent that would satisfy the most ardent lover of "diffusion of focus." The pupils generally were enlarged until the iris disappeared or was only a ring. This bored me. I grew weary. With plates at \$1.25 per dozen, six or eight flash powders for a dollar, and the depth of the pocketbook only moderate, I was sick. Friends said they had given up portraits because they could not get any eyes. Good subjects were scarce, and they came only in the evening. Therefore, what couldn't be endured must be cured.

One evening I set about curing the evil. I had a good subject, a fine face with a clear complexion, photographically speaking; large brown eyes, that had repeatedly made a smudge on my plates, I was determined to have. After getting the pose, deciding upon the angle for the light and the point at which the eyes were to be directed, I made a raid upon the linen closet and got a sheet. This was hung up behind the point of sight. I lighted the room as brightly as possible and set a large student lamp-flame at the place where the sitter was to look. "Look right into the blaze" was the direction. Then I uncapped and blazed away. It was a flash tablet, and there was a bang as well as a blaze.

But all was well. Those eyes were on the plate without a wink. The result was so good that I made exposures of plates until the house was so full of magnesia powder that the female portion of the firm, of whom I am the "natural protector," issued an injunction. I proposed to argue the case and have the injunction dissolved, but concluded to postpone because I saw indications of its being made perpetual.

"Wait 'till the clouds roll by" is good sense if not good music. I waited. Tried my dodge over and over again and found no more trouble with the eyes and less smoke from flash lamps.

Have the sitter look into the flame of the brightest lamp at hand and you will find that the flash has very little influence upon the eye. A white surface behind the lamp is also an advantage. But if you are a man be sure you are solid with the "powers that be" before you try to convert the parlor into a studio, and fire half a dozen magnesium powder cartridges in succession in honor of my discovery. The advice is patented, the discovery free to all.

[From the *Photographic News*.]

OSCAR GUSTAV REJLANDER.

BY H. P. ROBINSON.

THE idea of an exhibition of all that could be gathered together of the works of O. G. Rejlander at the Camera Club was a happy one, and will serve to recall to the memory of many photographers the great artist and genial friend who honored our art with his genius; and he was the greatest genius who ever gave up to photography talents which would have enabled their possessor to shine in any form of art.

Rejlander was one of the earliest friends I made through photography, and it gives me great pleasure to respond to the request of the editor of the *Photo-*

graphic News to say a few words on the man and his works. I first met him at a meeting of the Birmingham Photographic Society in 1858. He was then living in Wolverhampton, and shortly after our meeting he came to visit me at Leamington, from which time until his death in January, 1875,* we continued in the closest friendship, and for many years in photographic criticism, our names—perhaps because we had the same aims, and partly also, probably, for the sake of alliteration—were coupled together, a conjunction of which I have always been proud; and it is a curious coincidence that our works have again come together, or, rather, followed each other, in the “One Man” exhibitions of the Camera Club.

At the time I have mentioned, Rejlander had made himself famous by many pictures which were far and away, in all essential art qualities, beyond anything that had ever been before shown, and especially by his wonderful composition which represented allegorically “The Two Ways of Life.” This was first shown at the Art Treasures Exhibition at Manchester, in 1857, to which exhibition, by the way, I had sent my first poor efforts at pictorial photography. This famous picture, as was also much of his best work, was executed at Wolverhampton, in a small studio in which many a photographer would scarcely have found room to photograph a single head. Here this astonishing group, consisting of about thirty figures, and attempting the highest poetry in art with so much success as to gain respect, if not approval, from all, was put together. Any one but an enthusiast would have seen the impossibility of success with such a subject in such materials, but amid difficulties that would have scared most men, Rejlander saw only the end, and if he did not succeed in reaching it, his failure was almost as honorable as complete success.

Apart from the subject, which is allegorical, and partly carried out by the use of the nude—now ruled, and rightly, to be outside the natural limitations of the art—the picture is a marvel of skill and excellence. In composition and in clearness of story telling it has never been surpassed in any art, and the apparent impossibilities he overcame have always been a wonder to those who know most of the means by which it was produced. No photograph has ever met with so much criticism, for and against. It was rejected at an Edinburgh exhibition, not, however, on its artistic merits; a picture intended to convey the highest moral was rejected because of its supposed immorality. It would take too much space here to trace the courses of the two youths, who are represented as going the two ways of life, the one to the good and the other to the bad. In 1858 Rejlander was persuaded to read a paper before the Photographic Society of London—the only one he ever read—in which he explained the meaning of every figure. At the same time, with the generous intention of being of use to photographers, and to further the cause of art, he, unfortunately, described the method by which the picture had been done; the little tricks and dodges to which he had to resort; how, for want of classic architecture for his background, he had to be content with a small portico in a friend's garden; how bits of drapery had to do duty for voluminous curtains: a simplicity into which others also have fallen, and thereby gave the clever critics the clew they wanted, and enabled the little souls to declare that the picture was only a thing of shreds and patches. It is so much easier to call a picture a patchwork combination than to under-

* Both almanacs record his death as taking place in January and June. This was obviously impossible. The real date was January 18, 1875.

stand the inner meaning of so superb a work as this masterpiece of Rejlander's ! He had a sense of the injustice of judging a work by the method of its production. He says in his paper : " I have a lively presentiment that the time will come when a work will be judged by its merits, and not by the method of its production ; and then, with some fostering care, things can and will be done that scarcely believers, and never unbelievers, yet dream of in their philosophy."

This picture was Rejlander's greatest effort, and I much regret that the committee of the club was not able to secure a full-sized copy for exhibition ; the small reduction gives a very inadequate idea of the large picture. In his paper the artist promised other and greater efforts in succeeding years ; the promise was never destined to be fulfilled. He often regretted that he never afterwards found time, and, indeed, the means—for such pictures are expensive to produce—to carry out his intention. He felt that such ambitious work was not properly appreciated, but he never lost faith in the method of combination printing, of which he was the originator, and occasionally employed it for smaller pictures up to the last. One of these, now in the Camera Club Exhibition, I greatly value. He was always brimming over with happy ideas, and would at any time prefer to express himself in a picture than writing. I was once in the middle of a now long-forgotten controversy, endeavoring to defend our art from those who could only see in it a mechanical trade, when I received the little picture I have mentioned from him. He was a volunteer as well as an artist. The photograph represents Rejlander the artist jumping up from before his easel to introduce Rejlander the volunteer. The contrast between the artist in velvet coat and broad-brimmed felt hat, and the same man in the same picture in his regimentals, was startling. Under it was written " O. G. R. introduces himself as a volunteer to H. P. R.," thus delicately and pleasantly conveying that his help was at my service.

In ordinary manipulation Rejlander could not be called a perfect photographer ; so that he conveyed his thoughts clearly, he did not care for delicacies of development or clean plates. To him art was a vehicle for conveying a thought. It was the thing to be said, not the manner of saying it, that demanded all his powers. He could never see the beauty of the indefinite. Being without affectation, a sound artist and real poet, nothing short of real art and true poetry would satisfy him. Though most original, he abhorred the eccentric.

Perhaps, after all, it was in fertility of ideas and imagination, and the readiness with which he used them, that he was at his greatest. As an example of his readiness, here is an illustration. He once sent home a portrait of a bright little boy dressed in velvet coat and knickerbockers. The boy had one hand in his pocket, and the action bent the figure a little aside. The picture was rejected because the figure was not upright. Rejlander immediately wrote underneath it, " I've got a pocket too ! " and the picture was at once a tremendous success. Yet, I remember an occasion when it happened that a title he strongly objected to turned one of his pictures into the most popular photograph of the day. It happened this way. He sent to an exhibition a picture of a very little boy yelling furiously. He was then making experiments in expressions to illustrate Darwin's " Expression of the Emotions in Man and Animals," and entitled this photograph " Mental Distress." In his notice of the exhibition, a former

editor of the *Photographic News*, the late ever-regretted H. Baden Pritchard, called the howling youngster "Gink's Baby." This hit the humor of the hour, which was then much interested in a book of that name, and it became the photograph of the day and sold by thousands; but Rejlander was never reconciled to the loss of his scientific title. Many examples may be quoted of his happy thoughts, both pathetic and humorous, but it would be difficult to describe them so as to do them justice, unaccompanied by the pictures. "Grief," "Night in London"—a most moving picture of a ragged and desolate boy seated on a door step, and "'Tis Light within—Dark without!"—a blind woman singing, are examples of the pathetic that occur at the moment; while the humorous are represented by "Did She?" one man (Rejlander himself) telling an amusing secret to another, whose face expresses a full appreciation of what he hears; and "She is looking at me, the dear creature!" an ugly and vain old man smirking and looking out of the corners of his eyes.

In the very interesting book of Darwin's I have mentioned are several figures in which Rejlander has tried to express in his own person the expressions intended to be conveyed. The contrasted figures of Anger and Humility on Plate VI, Figs. 2 and 3, are perfect, and show what possibilities as an actor were in him had he followed that branch of art.

Personally, Rejlander was beloved by all who knew him. His winning ways, his kindly genial charm, his ever fresh and humorous anecdotes, his quaint thoughts and original expressions, his enthusiasm for all art, and especially for the art of his adoption, his simplicity and sincerity, endeared him to his many friends. He was never known to use a word that would hurt the feelings of others; he preferred to be silent rather than condemn the work of another, and always took great delight in praising the attempts of a brother photographer when he honestly could. His was not one of those envious natures that cannot brook any success not his own; he rejoiced in the progress of the art, even when it was accomplished by other hands. He was absolutely free from petty jealousy. It was not necessary, nor his way, as it unfortunately is the way with some photographic aspirants, to denounce all art and artists so that he may stand in the foreground on his own little molehill. He was a rare man, a great artist, and a loving friend.

THE PHOTO-MECHANICAL PRINTING METHODS AS EMPLOYED IN THE JUBILEE YEAR OF PHOTOGRAPHY.

BY THOMAS BOLAS.

(Continued.)

RECENT METHODS OF MAKING TYPE BLOCKS FROM HALF-TONE SUBJECTS.

ANY impression in a fatty ink, of the nature of printers' ink, which may be transferred to stone or zinc for printing after the lithographic method, may be considered as a germ of a typographic printing block, as, if such an impression is transferred to a zinc plate, the uncovered parts may be etched away so as to leave the covered parts standing in high relief. The details of the method of thus etching a zinc plate have already been given. Let us take the reverse case. One has a typographic block, and it is more convenient to print impressions by the lithographic machine than from the block; it is only necessary to make a

print from the block and transfer it to the stone. Thus it will be seen that lithographic printing and typographic printing are very closely connected, so closely that when a subject is prepared for one it may be printed by either, as convenience may indicate. The *Official Gazette* of the American Patent Office is set up in type, but the printing of all, except the index sheets and the covers, is done on a litho-machine.

These remarks bring us to the point where photo-lithography and phototypography may be considered together, and that the making of a fatty transfer is equivalent to the production of a printing surface suitable for printing by either method.

In making a type block from a gradated photograph, the first step is to translate the evenly gradated tints of the latter into a line system, or a stipple of corresponding intensities. When a photograph is transferred to a wood block, this is done by the personal skill of the individual who engraves the block; but this is by no means to be regarded as photo-engraving proper, so my remarks will be confined to processes in which the translation is effected automatically.

There are many methods of so translating the tints into points, lines, or dots, that even to mention all would be impracticable.

In an earlier part of this paper, the method of Asser was referred to, a photolithographic transfer being made on a sheet of starched or pasted paper, made sensitive by means of potassium bichromate; and by putting down such a transfer on zinc, and etching into relief, excellent results may be obtained. It may also be mentioned that, as long ago as 1866, Messrs. E. & J. Bullock, of Leamington, obtained a patent for a mode of photo-lithography in half-tone, and a print issued during the year in question with *The British Journal of Photography*, shows that their work was equal to anything that has been done since. Why, then, you may ask, did not the process become a great thing commercially, and make its mark? The answer is simply this—the invention came before its time, neither good litho-machining nor zinc-etching being practiced at the time. The expired patent of Bullock Brothers (No. 2954, 1866) will be read with interest, and its value is well illustrated by the fact that the essential points of it have been claimed by very many subsequent patentees. Bullocks claim the production of reticulated transparencies by copying a negative over; when a grained surface is laid, this transparency affords the means of making a grained negative; but the method by which their best work was made is a second process included in the same patent. Ordinary or photographic paper is coated with a glutinous substance, and printed with a reticulated pattern. Let me now quote from the specification: “In this case the specks of ink themselves form a medium, and by their aid excessive contrasts are avoided, and half-tones secured. Such a picture, when so obtained, is passed to a lithographic stone or zinc plate, and a printed proof produced therefrom; by the aid of chromo-lithography colored proofs may be produced.” The coating of the paper with a glutinous substance may “be conducted in connection with bichromate of potash or bichromate of ammonia.” The said transfer paper may be used, “whether the impression be a lithograph, or a zincograph, an impression from an electrotpe, or from an engraved or etched plate.”

By transferring a coarsely-grained collotype to stone or zinc a very good grain image is obtained, and the coarse reticulation of the gelatine is very much

facilitated by adding chloride of calcium to the sensitive mixture. The following answers very well:

Gelatine.....	6 parts.
Water.....	60 "
Bichromate of ammonia.....	1 "
Chloride of calcium.....	2 "

Printing surfaces thus obtained, whether lithographic or typographic, resemble those of Pretsch or of Dallas on the one hand, and those of Sprague on the other hand.

In order to obtain a transparency in which the tints are translated into points, lines, or dots, Algeyer and Bolhœvener have recently suggested a method in which a collotype plate is exposed under a negative; and after this plate has been soaked and inked up in the usual way, the fatty image is reinforced by dusting with an opaque powder. This method is of course dependent on the reticulation of the gelatine for the production of a grain. From such a transparency a negative may be made by contact printing, and from this a photo-litho transfer by any one of the well-known methods.

Meisenbach, of Munich, has recently obtained a patent in which he claims some details as to well-known methods of breaking up the grain of a photograph by means of a network, and he more especially claims the shifting of the network during the time of exposure. As regards this point, something similar was described by Bertschold in the volume of the *Photographic News* for 1859. Notwithstanding the fact that one cannot find any very striking features in the patent of Mr. Meisenbach, this gentleman has produced some typographic blocks of surprising excellence, examples of which are now before you.

We now come to an important feature in connection with the subject, that is to say, the direct translation, by mechanical means, of the gradations of depth existing in the Woodbury relief into corresponding shades of stipple or granulation; but before entering into these, let me call your attention to a method of granulating the relief itself, which Mr. Woodbury has made the basis of a method by which excellent printing blocks have been made.

Mr. Woodbury exposes his ordinary relief tissue under a transparency with a piece of network interposed, the effect of this being to produce a decided grain all over the high portions of the resulting relief and no grain over the deep parts, intermediate portions being grained to an intermediate extent. A reverse cast from the grained relief thus obtained is the printing block. This mode of procedure is subject to one disadvantage in actual practice, as the various printing parts of the resulting block do not lie accurately on one plane, as is the case with a block made by etching a plate of zinc into relief. Mr. Woodbury, however, overcame this objection by a modification of the process in which a transfer is obtained directly from the relief.

The following quotation from Woodbury's specification of 1873 will serve to fully elucidate the nature of the process referred to: "I prepare sheets of bichromatized gelatine, such as is used in the process called 'Woodburytype,' and expose these under a photographic positive to the action of light, but interposing between the positive and the gelatine film a transparency on collodion or mica of what is known as mosquito netting, Brussels net, tulle, and so forth, which has the effect of breaking up the resulting relief into a multitude of fine square hexagonal lines; or for some subjects I interpose a transparency on mica

or collodion of any design of a similar nature that will have the same effect, such as an impression from a grained stone, or the same from a number of fine ruled lines. The sheet of gelatine, when washed, will give a relief having the positive photograph represented by a number of lines, instead of the simple half-tone it originally possessed. I then take an impression from this by means of hydraulic or other pressure in any soft metal, and use the block so obtained for printing at a type press where only a few copies are wanted, but where large numbers are required I electotype the same in the ordinary way. I prefer to use diffused daylight or sunshine through ground glass or tissue paper to produce the relief, as in that case the light in the parts that represent the white creeps round the lines, thus partially obliterating them in that part, and leaving them strongest only in the parts printing dark. I sometimes adopt another method. I take a negative of the net work by transmitted light, and copy this together with the negative to be reproduced, thus reproducing a positive with the lines already thereon, from which I proceed to make a relief and blocks as stated."

(To be continued.)

[From the Photographic Review.]

"AT HOME" PORTRAITURE.—MR. W. H. HARRISON'S EXPERIENCE.—GROUPS.

PERHAPS groups are the most trying subjects we meet with. The inequality of the light is a cause of great trouble. In a group of eight or nine persons those farthest from the source of light are but dimly lighted, and that end of the plate will require very much more exposure than the opposite. A sheet placed on the carpet near them, in addition to the side reflection, will somewhat assist to equalize matters; and if the cap of the lens be taken off and replaced in such a manner as to give the shorter exposure to the side nearer the window, the difficulty is still further reduced. The rest must be done in development and after-treatment of the negative. Personally I like a slow development and think my readers will grant the desirability of its adoption for this class of work.

Large groups ought not to be attempted indoors, unless the room be exceptionally large and well lighted. If the apartment be but badly lighted it is preferable to photograph the group out of doors or at the studio. Parlor portraiture is suitable for single figures and small groups, but when a group numbering more than seven or eight individuals is required to be photographed, not only is the lighting a difficulty, but trouble is also occasioned by the limited space available between sitters and camera. It is well to have a short focus lens by us; it will often help us over a difficulty otherwise insurmountable.

I well remember the trouble I once experienced in photographing a group of seven or eight persons and a dog in a very moderately-lighted drawing-room, being supplied only with a rectilinear lens. Fortunately the room was long, so I had no difficulty in getting well away from my subjects; but the length of exposure necessary and the restlessness of my canine sitter combined to make the task anything but an easy one.

As I have previously remarked, the time of exposure in drawing-room portraiture is very prolonged. Due consideration should be given to this fact when posing, more especially with children, and positions chosen in which the temptation to move is reduced to a minimum. In grouping children, for instance, it is often advisable to place the heads together so that one forms a slight support

for the other. Sitting positions for the same reason are usually more successful than standing; in fact, experience gained in the bygone days of slow plates and long exposures will be found of great service in selecting positions in which it is easy to keep still. This is a matter which, in these times of instantaneous photography, is to a great extent lost sight of.

One word in favor of platinotype printing. The average negative produced in the drawing-room is far more suitable for printing by this process than for silver. The lighting in most cases is necessarily somewhat harder than in the studio, and by printing in platinum the violent contrasts are considerably modified; and of course the resulting picture has the double advantage of being both more artistic and permanent, "a thing of beauty" which "is a joy for ever." To amateurs who have hitherto had no experience in this artistic style of printing, I would say "by all means try it." They will find it more interesting, entailing less trouble, and giving permanent results.

To return to the subject of apparatus, I would advise my readers to equip themselves as lightly as possible. It is most fatiguing to be compelled to carry a heavy head rest and studio camera stand, in addition to the other indispensable apparatus up the quantity of steps one sometimes has to ascend.

The studio camera stand is altogether unnecessary; the ordinary tripod answers the purpose quite as well if corks be placed on the spikes in order to protect the carpet. I would recommend a tripod the height of which may be regulated at will by the well-known sliding arrangement. The head rest should be as light as is compatible with stability. A good stock of dark slides is very convenient, but provision should also be made for the changing of plates.

The use of a room, which can be temporarily darkened, is generally placed at the disposal of the photographer; but it is well to be provided with some form of changing box or bag, many of which are in the market.

Many opportunities of doing business will present themselves in connection with evening parties, masquerade balls, bazaars, exhibitions, etc., whereby if the operator can work successfully by artificial light, he may increase business during the winter months. The demand for night photography is very great, and there opens up before us almost unlimited scope for good work in this direction.

It must remain for the enterprising reader to use whatever form of artificial light he chooses. It is not my intention to enter more fully into that subject in this paper.

I have now tried to bring before my readers some of the advantages and difficulties of drawing-room portraiture, and have recommended the methods of making the most of these advantages, and overcoming the difficulties, being the while guided by my own experience.

Perhaps some of my remarks will not be found to be in accordance with the views held by many photographers. We all know that each operator has his own pet methods of working, and some there are who are very conservative in these matters; yet if any, after wading through this and my previous articles on the subject, obtain any fresh views which prove of after service to them, I shall consider myself amply repaid for any effort which I have made.

All communications for the columns of the BULLETIN should reach us on Monday preceding the day of issue, to insure their publication at that time.

[From the *American Microscopical Journal*.]

THE COLORED SCREEN IN PHOTO-MICROGRAPHY.

[Abstract.]

BY PROFESSOR ROMYN HITCHCOCK.

AN ordinary gelatino-bromide plate is sensitive to the spectrum of sunlight from a point between the Fraunhofer lines E and F to about K. The maximum photographic action is about G. By considerably prolonging the time of exposure the limit of photographic action at the red end of the spectrum is greatly extended. In practice the light below the green of the spectrum may be regarded as quite inactive when we take photographs with ordinary plates.

By introducing a colored screen, a plate of yellow glass for example, in the path of the light, we may absorb the more active rays, and prolong the time of exposure until the yellow rays have time to act upon the sensitive plate. In practice, however, it is found that there are two difficulties about this method of procedure; first, in obtaining a satisfactory screen, and second, in the long exposure necessary when working with the comparatively inactive rays.

With color-sensitive plates, such as are now in general use abroad and gradually being introduced in this country, the range of photographic action towards the red is greatly extended. With such plates the yellow screen can be used with great advantage.

A few years since it was customary to work with monochromatic blue light in photo-micrography, and the ammonio-sulphate of copper blue cell was much in use. When color-sensitive plates were introduced yellow screens took the place of blue, because it was found that many specimens had yellow and red and brown parts which were not well photographed with blue light.

The color and thickness of the screen both require attention. If it be too thin the blue light is not sufficiently cut off. In particular cases an almost monochromatic yellow light is desirable, as when it is desired to obtain sharp outlines of deeply stained objects regardless of structural details. But generally a rather broader spectrum range is desirable, for the light employed should correspond to the different colors or shades of color of the object. It is owing to neglect of this consideration that we often see photo micrographs which are mere silhouettes, while the objects show much more structure to the eye. This is frequently observed in photographs of such structures as the tongue and sting of a bee and legs of insects. In other preparations in which the color is a stain—brown or red for example—the fault lies partly in the exposure, which, in many cases, is insufficient to give more than outlines and blank interiors. This is frequently noticeable in photographs of bacteria.

By a proper choice of a screen, if a screen is required, a photograph should show any object as clearly as we can see it in the microscope.

Color-sensitive plates may be said to be indispensable in the photography of rock sections with polarized light.

The yellow solution devised by Professor Zettnow, of Berlin, is used with much favor by many workers. It is composed as follows: Copper sulphate, 175 grams; potassic bichromate, 17 grams; water, 1,000 c.c.

The true function of the color screen should be to give definition and detail, not to increase contrast between the object and the field, as many observers seem to believe.

THE REDUCING OF NEGATIVES AND POSITIVES AND OTHER PROPERTIES OF THE ACID FIXING BATH.

BY ALEXANDER LAINER.

THE several methods of reduction are unlike in their manner of action, inasmuch as sometimes too great an equalizing of the half tones, and more frequently, a too rapid disappearing of the fine details in the shadows, is to be apprehended.

1. A gradual and at the same time very clearing reduction is obtained with a strong sulphite fixing bath.

I mixed equal parts of fixing-salt solution and acid sulphite solution in a tray, which I covered with a glass plate greased at the edges, to prevent too quick an escape of the dioxide of sulphur.

This strong acid fixing bath acts very gradually in reducing. Negatives which, in consequence of long development, or by application of a powerful reducing developer, became foggy towards the end of development, became completely clear within from six to twelve hours according to the density of the fog, and sensitometer plates showed the high numbers fully intact, the gelatine becoming clear as glass according to the duration of the action. Under this gradual influence a spoiling of the plates can hardly take place.

I tried also to subsequently treat a plate with fixing solution after submitting it for an hour to the acid sulphite solution, but this led to no results regarding the reduction.

I applied in my experiments a sulphite solution, acidified with muriatic acid (250 gram. sulphite of soda, 1 liter water, 70 c.c. muriatic acid; the sulphite of soda to be completely dissolved), but other sulphite solutions may also be used.

2. The reduction is accelerated and proceeds also very good if a little red prussiate of potassium is added. This reducing solution does not keep, but can always be made active again by a small addition of red prussiate of potassium.

I found the acid fixing bath also very suitable for the reducer with potassium ferrous oxalate, this solution remaining clear for a long time, while it decomposes quickly and loses its action by application of the ordinary fixing bath. The latter observation was already made known by Belitzki, who as well as Dr. Eder and Dr. Krügener made tests with the free acid fixing baths, first introduced by me, and who will fairly confirm its advantages. B. Belitzki, for instance, writes (*Deutsche Phot. Zeitung*, 371): "The acid fixing bath is indeed of the greatest advantage for the fixing of negatives, no matter what sort of developer is used.

3. The strong acid fixing bath acts upon already toned and fixed albumen prints, aristotypes, etc., considerably as a reducer under prolonged influence, whereby the tone suffers also a change.

4. I mention here also an observation by Belitzki about the application of the acid fixing bath as a preliminary bath for development with oxalate of iron. Belitzki found that the acid fixing bath acts better in a dilution 1 : 2,000 to 1 : 3,000, than fixing soda only, modelling the high lights much better.

5. Another not unimportant observation I made with regard to old and already used acid fixing baths, which are kept in barrels at the Imperial Institute for Photography to obtain the silver they contain.

The neutral old fixing baths decompose by precipitating very finely distributed sulphide of silver, which, even after months, will not precipitate, not even with sulphuret of potassium, causing, therefore, a loss, as in practical life nobody will take the trouble to decant or filter.

The old acid fixing bath remains completely clear, and precipitation may take place after the known methods, or after the new method of precipitating with reducing salts, which I shall describe at some future time, the deposit falling completely to the bottom, after which the remaining clear liquid can easily be decanted without loss of silver.

6. In one of the 1889 numbers of the "Photographische Mittheilungen" the question was asked, in what manner plates intensified with bichloride of mercury, which had become brown in consequence of the bad washing out of the fixing soda, could be restored, and the answer was that although the question had been asked a good many times, so far nobody had been able to give a satisfactory remedy.

I recommend for the removal of this brown coloration also the strong acid fixing bath (equal parts of acid sulphite solution and fixing salt solution).

In some experimental trials the brown spots, as well as the whitish glittering parts, had been removed completely within a half to two hours, although strong colorations and spots had purposely been produced.

7. I have also darkened gelatine negatives with nitrate of silver and by subsequent exposure, as happens in printing on albumen paper which is not completely dry, and even here the defect was removed by the strong acid fixing bath, provided that the nitrate of silver had not penetrated already too far. On varnished negatives the varnish has first to be removed.

AN AMATEUR PHOTOGRAPHER ON THE NILE AND IN THE DESERT OF SINAI.

BY DR. H. CARRINGTON BOLTON.

(Notes on an Address before the New York Camera Club.)

PROFESSOR BOLTON began his lecture with a few preliminary remarks, in which he said that his experience as an amateur photographer was only a little more than a year old. The main object of his trip to the peninsula of Sinai was in search of a noted locality where sonorous sand is found, and in order to clear up some discrepancies in regard to pictures of this celebrated sand-bank, in which two authorities differed so materially as to be totally unreliable. Wishing to bring back with him faithful records of the true state of affairs at the point of interest, he undertook to become practically acquainted with photography, which as a chemist he had understood theoretically for some years. Since his journey would have to be made with the aid of camels, and as every pound of weight was something to be carefully considered, he concluded to carry with him only celluloid films. Having mastered their manipulation under the guidance of Dr. A. A. Julien, of the School of Mines, Columbia College, he set forth upon his journey stocked with a large number of films. His pictures are certainly a wonderfully good exhibit of the capabilities of this new substitute for glass. Some of them are spotted in places and look somewhat strange, nevertheless the percentage of poor pictures is very small, and he assured us that if he had the journey to make again he would most certainly take films in preference to glass

plates, the question of weight being so important and the failures with films comparatively few. This is certainly very much to say in favor of the celluloid support, especially when we consider how recent has been its production on a commercial basis.

In his journey up the Nile he caught many pretty and characteristic views of this noted stream, and his description of the various pictures was exceedingly interesting; by far the larger part of them being scenes not usually noted by the traveler. Among other excellent views were several of the interiors of the tombs of the sacred bulls of Apis, taken with the magnesium flash-light. These were some of the best work of the kind we have seen—clean, well defined, and as bright as if taken in sunlight. Pictures of the Bedouins, the camel train, the various native towns, oases and other objects of interest in the desert of Sinai, all showed that the Doctor is certainly an amateur of more than ordinary skill. Arriving at Mount Sinai, he obtained an excellent view of the Greek monastery, also a picture of Photius, the deposed Patriarch of Jerusalem, who has charge of it. He also showed excellent views of the interior as it now is, and some curious copies of lithographs of the old church, which he obtained from books still preserved in the monastery. The country around Sinai is wild and rocky, and almost entirely devoid of water. Some excellent views of this rough scenery gave an idea of the character of the country through which he passed.

Dr. Bolton evidently made good use of his camera and films, and the members of the New York Camera Club had an uncommonly good opportunity of seeing views of a country where very few travelers venture, and a still smaller number of photographers. Judging from the crowded condition of the rooms and the attention of the audience, the lecture was thoroughly enjoyed by all present.

THE SALTING AND EXCITING OF DRAWING AND OTHER COMMERCIAL PAPERS.

BY LYONEL CLARK.

(Continued.)

I NEED hardly go into the manner of floating paper; it must be well known to all of you. The only point to be aimed at is to avoid bubbles. This is done by placing one edge of the paper on the liquid, and then lowering the sheet down gradually; it should then be lifted again by one corner and examined for bubbles, and if any are seen they should be broken with a glass rod or the tip of the finger-nail. Most English papers will be found to take the salting very unwillingly, but if left on the liquid for a short time they eventually become evenly coated. If very repellant of moisture, they may be brushed over with a solution of ox gall or very weak HCl and water. By this means the surface size is destroyed. I myself prefer, however, to rub over them a little of the salting mixture itself with a tuft of swans-down, calico, or cotton-wool, and then float them.

It is evident that the time that the papers should remain on the salting bath must depend on the nature of the bath and the kind of paper used. If our bath be rich in gelatine, the paper will naturally draw off a considerable and sufficient quantity of salt. But if our paper be hard, and the gelatine present in small quantity, some time must be allowed for the salting solutions to get hold of the paper. Somewhere between two or five minutes, floating may be taken as the average; if too long floated, the thick paper at least will absorb too much salt.

With the above salting bath, as soon as the film is seen to be evenly attached all over the paper, it may be considered sufficiently floated.

The only failures that I can imagine likely to happen in salting papers are bubbles, or portions of the paper untouched by the salt, or else there may, on printing, be noticed a sinking in of the image generally; that is to say, by reflected light it appears feeble and lacks intensity, whereas when looked at by transmitted light, the image is seen to be vigorous, but to lie in instead of on the paper. This, if it does not arise from the softness of the paper itself, will probably be caused by the salting bath having been in an acid condition. This acidity destroys the natural size of the paper, and makes it like blotting paper, absorbing speedily all the salting liquid. For this reason, when using ammonium chloride, if I have reason to fear its having become acid, I add a drop or two of ammonia till litmus shows an alkaline reaction. The ammonium chloride may become acid through loss of ammonia if it be added to the gelatine solution when very hot; it should, therefore, only be stirred in just before using.

In concluding the directions for salting papers, I cannot do better than point out that the object to be attained is to get a thin film, rich in salt and organic matter, right on the very surface of the paper, and not in its texture.

We now arrive at our third and last stage—namely, the exciting of the paper. The salt we generally use for this purpose is the nitrate of silver. The salt is very soluble in water, and we can therefore prepare solutions of almost any strength. As with our salting bath, the question arises, what amount are we to use to get the best results? Experiment will best answer this for us. It would appear at first sight that the strength of the silver bath would have no effect, because only as much chloride of silver will be formed as there is chloride in the print; but when we reduce the strength to below 30 grains per ounce, we shall find that the prints take longer to darken, and never attain anything like the same blackness that the stronger baths give. The cause of this is explained in the following manner. If we pour some solution on to a piece of salted paper, some of it will be absorbed by the paper, some converted into chloride, and some, the excess, remain liquid on the surface; but there is a limit to the quantity that will remain on the paper, and any beyond this will drop off when the paper is hung up. Now, if the liquid that remains on the surface is poor in silver, when it dries out but little free nitrate of silver will remain; if, on the contrary, this liquid be rich in silver, some considerable portion will be left, and we see, therefore, the necessity of using a strong bath, for we have established the fact that we must have nitrate in excess; and experiment further shows that, within limits, the darkening of the print varies as the quantity of free nitrate present. Although there is no special attribute in the exact figures, yet a strength of somewhere about 60 grains to the ounce will be found a good all-round exciting bath.

(*To be continued.*)

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

FIRST annual meeting of the Executive Committee, held at the National Hotel, Washington, D. C., January 22, 1890. Present: J. M. Appleton, *President*; George H. Hastings, *First Vice-President*; W. V. Ranger, *Second Vice-President*; D. R. Coover, *Secretary*; G. M. Carlisle, *Treasurer*.

The meeting was called to order by the President. The first order of busi-

ness was the reading of the reports of the Secretary and the Treasurer for the year ending December 31, 1889.

REPORT OF AUDITING COMMITTEE.

We, the Auditing Committee, have examined the books and vouchers of the Secretary and the Treasurer and find them correct.

GEORGE H. HASTINGS,
W. V. RANGER,
D. R. COOVER,
Committee.

The reports of the Secretary and Treasurer were received, and the Committee was discharged.

The eleventh annual convention will be held at Washington, D. C., August 12 to 16, 1890.

Mr. John Bartlett, of Philadelphia, Editor of *American Journal of Photography*, was appointed as the Committee on the Progress of Photography.

List of awards for 1890 is as follows: The grand prize will be a group in bronze, entitled "Nearing the Goal," value, \$225. Governed by the following rules and regulations:

Competitors for this award shall exhibit three plain photographs, illustrating Tennyson's poem "Enoch Arden," the pictures not to be less than 13 or more than 22 inches in length.

The pictures must be framed, either with or without glass. The award to be made for the most meritorious collection.

Class A.—A beautiful silver "placque" mounted in plush, representing "Victory," for the best exhibit of genre photographs.

Competitors for this class shall exhibit six photographs. The subjects are to be chosen by the photographer and appropriately inscribed; size not less than 13 or more than 22 inches in length, and framed with or without glass. The award to be made for the best collection.

Class B.—One gold, one silver and one bronze medal, for the best collection of portrait photography, size 14 x 17 inches or larger.

Class C.—One gold, one silver and one bronze medal, for the best collection of portrait photography; size 11 x 14 inches or smaller.

Class D.—One gold, one silver and one bronze medal, for the best collection of landscape photographs; one silver and one bronze medal for the best collection of marine views; one silver and one bronze medal for the best collection of architectural views.

Class E.—One silver and one bronze medal, for the six most artistically retouched negatives, any size; prints made before and after retouching to be exhibited with the negatives.

Class F.—One silver and one bronze medal for the best six plain enlargements, either in silver, bromide, albumen, carbon or platinum; size not less than 18 x 22 inches.

Class G.—One silver medal for the best improvement in photographic appliances introduced since the last convention.

Class H.—One gold, one silver, and one bronze medal, for the best foreign exhibits of portrait photography, framed or unframed, but delivered to the association free from all charges.

Exhibits in this class will be admitted to the United States free, by sending the same directed to the Secretary of the Photographers' Association of America, Washington, D. C.

Competitors in all classes except Class H must be members, residing in the United States or Canada.

A diploma will be awarded for the most tastefully arranged exhibit.

Competitors for Grand Prize and Class A cannot enter in classes B or C, but all can compete for the grand award.

The President will appoint a judge in each class, the competitors choose another, and those two select a third, with the exception of Class H, which will be appointed in full by the President. Each judge must examine exhibits separately from the others, and hand in a sealed report of his markings to the Executive Committee, who shall open them and determine the winners.

Should any exhibitor or exhibitors use their influence in any way, directly or indirectly, with the judges during their term of office, in favor of any exhibit, it shall be the duty of the judges to strike their exhibit or exhibits from the list.

Rules Governing Judges in the Grand Prize.—The points to be considered are: 1st—Historic; 2d—Originality; 3d—Composition; 4th—Lighting; 5th—Technique.

Ten marks to be the highest for any one point, consequently fifty marks the most that can be given to any one picture.

The standard of this award must be thirty-five markings out of a possible fifty.

Rules Governing Judges in Class A.—The principal points to be considered are: 1st—Originality; 2d—Composition; 3d—Lighting; 4th—Technique.

Rules Governing Judges in Classes B, C, D and H.—The following points to be considered are: 1st—Lighting; 2d—Posing; 3d—Chemical effect; 4th—General effects or finish.

Ten marks to be the highest for any one point, consequently, forty marks the most that can be given to any one picture.

The above regulations also to govern class A.

Applications for space must be made to George H. Hastings, 147 Tremont street, Boston, Mass.

Entries to close on Tuesday, July 15th, and no space to be allotted for exhibits after that date. All exhibits must be shipped so as to reach the exhibition on the Saturday preceding the opening of the same, and all charges to be prepaid.

Each picture, or set of pictures, must be marked with a letter signifying the class in which it is offered for competition.

The exhibition of photographs connected with the convention is to be considered an art exhibition, pure and simple. In order not to detract from this standard, no sign of any description shall be allowed in the hall devoted to the display of photographs, except the name and address of the exhibitor.

No exhibit for the Grand Prize, or Classes A, B, C, D and H, to occupy space of more than eight lineal feet, and in Class E, ten lineal feet.

All photographs exhibited must be from negatives made since the Tenth Annual Convention, held at Boston, Mass., August, 1889.

All exhibitors must see that their display is properly placed before 10 o'clock A. M., on August 12th, and no exhibits will be admitted after that hour.

All art exhibits must be sent to George H. Hastings, Art Department Photographers' Association of America, Washington, D. C. All charges prepaid.

Exhibits for the stock department to be shipped in care of D. Rad Coover, Secretary Photographers' Association of America, Washington, D. C., charges prepaid and placed in position by 12 M. August 12th.

The art and stock departments will be closed each day from 10 o'clock A. M. to 12 o'clock M. to secure a large attendance at the meetings.

The evening sessions will be devoted to art education, consisting of art criticisms on photography and practical talks from practical men, discussions, etc.

One of the special features of the Convention will be the unveiling of the monument to Daguerre, executed by Mr. J. Scott Hartley, of New York, which will be placed in or near the entrance of the Smithsonian Institute.

The following committees were appointed: George H. Hastings, on medals and badges; G. M. Carlisle and George H. Hastings, on hotels; G. M. Carlisle, on procuring a stenographer.

The art department will be in charge of George Hastings, First Vice-President.

W. V. Ranger, Committee on Railroads, who will sign all return railroad certificates.

G. M. Carlisle and George H. Hastings, Committee on Hall Accommodations.

OUR ILLUSTRATION.

ACCORDING to our promise of last issue, we present to our readers with this issue a silver albumen print. The view is one of a series of studies made by Mr. J. R. Husson in and around New York City. It is interesting from the fact that it is taken with the aristoscope lens, which is, undoubtedly, an instrument of unusual merit from an optical standpoint. As a study, the picture is charming, full of the quiet of nature, and exhibiting that fascinating conjunction of light and shade that make such scenes so pleasing to the artist photographer.

It is surprising that, with such charming bits of landscape so near the City of New York, we see so much amateur work that is commonplace and uninteresting.

PHOTOGRAPHS have, over and over again, formed an important element in the evidence in divorce cases, but rarely in so novel a manner as in a Scotch divorce case trial last week. The respondent, in accordance with Scotch law, had been cited to appear, but she took no notice of the order, and a photograph was put in for purposes of identification, and to show that the order had been duly served upon the right person. To this photograph the respondent's counsel took an initial objection, and, after the evidence had been heard, contended that the Court should find the case "not proven," on the ground that the photograph was not sufficient. Lord Trayner, however, held that the photograph was admissible, and not only so, but that the photograph of the co-respondent, who did not appear, should be admitted, and pronounced for the petitioner. It is not every judge who is such a believer in the faithfulness of photography. Cases might be cited where the judge absolutely refused to receive photographs as evidence of identification. A good deal, perhaps, depends upon the photograph.—*Photographic News*.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.C.S.**
and a corps of practical assistants.

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in the succeeding number. It is also necessary to notify
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and to state for what period the advertisement should
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E. & H. T. ANTHONY & CO., Publishers.

AMERICAN INSTITUTE — PHOTOGRAPHIC SECTION.

CLINTON HALL, 19 ASTOR PLACE.

REGULAR MEETING, FEBRUARY 4, 1890,
the *Vice-President*, J. B. GARDNER, in the
chair.

Secretary MASON announced the names of
the photographic journals and papers re-
ceived for the section since its last meeting,
for which the usual vote of thanks was ten-
dered.

The Chairman announced that there would
be an informal meeting of the section, Febru-
ary 19th, at 8 o'clock P.M., and a regular
meeting March 4th, at which time there will be
a lantern exhibition of views in and about New
York City. The programme for the evening
was "A Talk on Art," by Dr. R. A. Baralt,
and a stereopticon exhibition of pictures made
from negatives by members and friends of the
section. The stereopticon was managed by
Mr. William Gray.

The Chairman stated that as Dr. Baralt
could not be present during the early part of
the evening, the first hour would be occupied

with the exhibition of the pictures. The hall
was now darkened and a miscellaneous col-
lection of slides from various parts of the
world were contributed by both amateur and
professional photographers. The titles of the
pictures were simply announced, and thus
time was given to all who desired to show
samples of their work. As the makers'
names were not announced, the audience
were left in perfect freedom to approve or
disapprove of the views and scenes that
passed before them.

At the close of the exhibit the Chairman
of the Board of Managers of the Institute, Mr.
Robert Rutter, occupied a few minutes with
some extemporaneous remarks concerning
the great variety of uses to which photography
was now applied, and how it occupied a
niche in the temple of art science that could be
filled with nothing else so appropriately in
the whole realm of individual skill and inge-
nuity.

Here followed Dr. Baralt's lecture on art,
which occupied three-quarters of an hour,
and was listened to with not only marked
attention, but with frequent demonstrations
of applause. The lecture was evidently to
all photographers who are inclined to study
the art side of their profession, a discourse
that will not only be cherished in their mem-
ories, but will inspire them to give greater
attention to this branch of their work.

The doctor, in closing his lecture, said:
"As the evening is far spent, I must omit
many things I should like to say; but I trust
in the near future I may again have the
honor of your company, and I will then tell
you what, in my judgment, there is in photog-
raphy that may justly be termed art. So
with many thanks for your attention, I bid
you all a kind good-night."

A resolution was then offered, prefaced
with some complimentary remarks by Mr.
Robert Rutter: "That a vote of thanks be
tendered to Dr. Baralt for his very instructive
and entertaining lecture." The resolution
was seconded, and also prefaced with some
words of approbation, and on being restated
by the Chairman and put to the house a
hearty and unanimous vote was promptly
given in the affirmative.

On motion the section then adjourned.

NEW ORLEANS CAMERA CLUB.

A MEETING of the New Orleans Camera
Club was held February 5th, in the hand-
somely appointed club-rooms on the third floor
of No. 3 Carondelet street. *President* HARRY

HOWARD occupied the chair, and *Secretary* R. S. CHARLES, Jr., attended to the minutes. The 1890 volume of the "Mosaics," with the compliments of Edward L. Wilson, of New York, and Volume XX of Anthony's BULLETIN, with the compliments of E. & H. T. Anthony & Co., of New York, were received.

The membership committee reported the addition of Mr. W. E. Ramsey, as a Corresponding Member, and Mr. George Parke as an Active Member.

The Governing Committee reported having insured the furniture and other contents of the club-rooms, and that the lockers will be rented for \$1 a year.

A cash balance on hand amounting to \$517.89 was reported by the Finance Committee.

Mr. Reynes submitted the club badge, consisting of a round silver disc, on whose edge in raised letters is the club's name, inside of which is a blue enameled surface and a silver camera. These can be procured from the Treasurer.

The Directors of the Lantern Slide Exchange reported having received eighty-one slides from New York. It was decided to exhibit these to the members on Monday, February 10th. The exhibition will take place in the club-rooms. Each member will be allowed one gentleman's invitation. Hon. B. C. Shields will be the lecturer.

Upon motion of Mr. Shields it was decided that the evening of Wednesday, February 25th, be devoted to hearing a lecture on some photographic subject by a member of the club, the President to appoint the lecturer.

Mr. Reynes moved that the club-rooms be thrown open for the inspection of the lady friends of the club upon some night to be appointed by a committee. The motion was adopted.

Mr. Reynes was appointed chairman of the committee with the privilege of appointing its members. It is proposed to make this a really enjoyable affair. Refreshments will be provided, entertainment secured and the wonders of the rooms disclosed.

Mr. Carpenter introduced an important motion which was adopted. Views of New Orleans should be made systematically, he said. The club has splendid photographs of all sorts of subjects but its own city. New York, Boston, San Francisco and other large cities have had their interesting corners and woods accurately pictured by their camera clubs. But none of these cities

offer the same historic interest—the same picturesqueness which are inherent to almost every portion of New Orleans. He moved, therefore, that a committee of three be appointed to select fifty or more scenes in New Orleans and vicinity to be photographed by the members of the club. These will be reported to the club and members assigned to take the views, a special day being set apart for the purpose.

Mr. Carpenter was made chairman of the committee and the club soon afterwards adjourned.

LYNN CAMERA CLUB.

MR. EDWARD LITTLE ROGERS' ADDRESS AT THE DEDICATION.

Ladies and Gentlemen,—How it happened to fall to me to welcome you to-night I hardly know, unless perhaps that I was the innocent cause of your being here.

Some weeks ago, when I was asked to submit to a winding-up process—turn a crank in fact—I intended to be funny, awfully funny, so funny that those who don't know me would go away and say, "How funny that man is!" But I don't feel funny to-night; all the fun has been sneezed out of me by "la grippe." My doctor has given me a sort of an amateur photographic treatment, and has dosed me with citrate of iron, carbonate of ammonia, bicarbonate of soda, chloride of sodium, bromide of potassium, etc., and with all that restrainer how can I be funny? I think if he had given me some hypo he would have fixed me.

I never intended to oblige you all to come here this evening, but when a man buys a dog and a camera no one can tell what will happen.

Some time ago I bought a dog—some of you may remember him; he went on our first outing. "Oh! that dog, how he did mind." But that dog started this club a photographing. How? As it is a matter of history I don't mind telling you!

I wanted a picture of him; in fact I made up my mind I should want many of him—a wholesale quantity, and so in a misguided moment I invested my savings in an outfit. I have been investing ever since, and the dog! Poor fellow, I sold him. I couldn't keep both, don't you know. He wouldn't keep still, and when I snapped the shutter, he wasn't there. The hundreds of plates I used on him gave me lots of experience in developing. The directions used to say: "Pour on the developer

and in about thirty seconds the image will appear." His never did.

My wife used to say that she never could find that I was in the least to blame, for either the light wasn't good, or I hadn't used the right kind of plate, or the plate was fogged or light struck, the shutter was too fast or too slow, or something, but never, of course, never the amateur.

My success was so marked that our worthy treasurer borrowed my outfit—by the way, did it ever occur to you how aptly the name "outfit" applies? Did you ever see one that did not have an out about it? I almost wonder they were not called misfits. Well, our treasurer borrowed my misfit—excuse me, outfit—and I showed him the way to run it. As he tells the story, I did not know whether the holders had plates in them or not; to ascertain, I pulled the slides just a little. He says that sort of treatment won't fog a 40 plate, but I think he must be wrong. Why! I once exposed a B plate an hour and forty minutes on an interior, and at the end of that time found I had not pulled my slide. I never could quite make out whether it was I or the plate that was fogged.

Our treasurer bought an outfit and the club was formed.

He drew—Drew—drew—drew—excuse my stuttering—into the club. Why our president went into photographics I have had hard work to find out. I asked him, and he only said "I wish I hadn't."

A few nights ago, while searching for material to make this extemporaneous speech from, I read that Daguerre drew Niepce into association. I had found my clew, and as that was the only Drew mentioned under "Photography," I knew of course that Daguerre, Drew and Niepce were co-laborers.

Thus was our club formed. You remember the proverb: "Behold! how large a plate a little pyrogallol will develop."

To get back where we started from. We do, indeed, extend to you a very hearty welcome; we are glad to see so many of you here. Our club is doing well; we have forty-four members, we have good rooms, as you can see for yourselves, and we are here to stay. To those who practice the art we say: "Come and join hands with us—in union there is strength." To all the rest of you we say: "Come and join us as social members," for we are a jolly good crowd; indeed we are. Our refreshments, hydrochinon soup, with electric sauce, and eikonogen ice cream, we trust you will all partake of, and with the

aqua fontalis drink to the success of the Lynn Camera Club.

The regular meeting of the Lynn Camera Club was held at the club rooms, Tuesday evening, February 4th, at 8 o'clock, seventeen members being present. The following were elected to membership: George S. Bliss, Thomson El. Welding Co.; Charles C. Blaisdell, Lynn; W. H. Godfrey, 24 Nichols street; F. W. Breed, Ocean street; Frank W. Makepeace, 19 Northern avenue; Fred. E. Bramhall, 78 Newhall street; W. T. Bowers, 15 Market street; J. W. Goodell, 4 Broad street; N. J. Bacheller, 40 Broad street; Alfred M. Attwill, 50 Broad street; L. B. Russell, Ocean street; Marcus M. Packer, 286 Washington street. Mrs. J. M. Appleton was transferred from associate to active membership. The matter of having a billiard and card table in the lower room for use of members was referred to a committee of three.

NIAGARA CAMERA CLUB.

THE Niagara Camera Club met February 6th, at O'Connor's studio. There were some twenty members present and not a few outsiders, friends of the members. An informal reception was held the first part of the evening, during which time members gave an exhibition of views taken by them. These included Mr. Holmes, Mr. Barnes, Mr. Van Valkenburgh, Rev. Mr. Sanborn, Mr. O'Connor, Mr. A. Raphael Beck and others.

The business meeting was presided over by the *President, Rev. John Wentworth Sanborn*. The most important business transacted was the adoption of the report of the Committee on Constitution and By-Laws, presented by Mr. Tuttle. Following this the President appointed his committees and the club fixed the date of the next meeting for Tuesday evening, February 18th, at which time the executive committee are expected to report what arrangements they have made for the annual outing of the club, which will take place February 22d.

The President appointed his committees as follows:

Executive Committee—Charles N. Van Valkenburgh, W. E. Tuttle, Louis Holmes.

Amusement Committee—M. O'Connor, W. E. Jenney, Louis Holmes.

Room Committee—W. H. Cross, Charles N. Van Valkenburgh, Mr. Sands.

Photographer Smith disappointed the club in not being able to give his lecture, owing to

an accident with chemicals in which he burned his hands. Mr. Allen was so busy with Mr. Smith's work that he begged to be excused, and it looked as if the flash-light pictures promised would fall through. Messrs. O'Connor and Tuttle, however, arranged a group picture and gave a most successful exhibit of the flash-light process.

The success of the club is more than assured. Several new members were taken in last night. It was decided to limit the date of admitting charter members to February 22d. Ladies who are amateur photographers will also be admitted to membership should they so desire. The initiation fee and dues for the first half year of charter members is one dollar.

THE PHOTOGRAPHIC SOCIETY OF JAPAN.

A MEETING of the Photographic Society of Japan was held at the Chamber of Commerce Rooms, Tokio, on December 12th, at 4.30 P.M.

The following gentlemen were unanimously elected as members of the Society: Mr. Tamamura, Dr. G. Wegener, and Messrs. Katzuzo, Takenouchi, E. H. R. Manley, and J. B. Coulson.

Objection had been taken to a certain preposed member on account of his having copied without permission, and sold, the pictures of a member of the Society. An explanation which was satisfactory both to the objecting member and to the Society was given, but the following resolution, proposed by Mr. E. R. Holmes, and seconded by Mr. Pallister, was unanimously passed: "That this Society discountenance, by all means in its power, the practice of copying the photographs of other artists for sale, and that, if the practice be continued, the Society take into consideration the desirability of making a by-law whereby such practice shall *ipso facto* exclude from membership of the Society."

Mr. K. Ogawa exhibited the colossal camera with which he had made photographs direct, measuring 38x30 inches, for the forthcoming exhibition, and an enormous tripod intended to be used with it in photographing interiors. The top of the tripod reached the roof of the hall. A monster printing-frame for making the pictures on paper measuring 4 feet 6 inches by 3 feet 6 inches, was also shown.

Mr. Kunishi showed the "Kodak," the smallest of the hand cameras now so popular, and Mr. Kajima some very beautiful opal-

types done on opal glass that had been coated with emulsion in Japan.

Mr. W. K. Burton read a paper on "Eikonogen," the new developer. The results of his experiments had certainly been to make him conclude that the developer had good qualities, but he considered the claims made by the makers to be quite extravagant. On the whole, Mr. Burton doubted if it would oust our old friend pyrogallic acid.

After the ordinary meeting was concluded, a special meeting was held, and Messrs. J. Johnston and F. Walkinshaw were elected members of Committee. Mr. A. J. Hare was elected Foreign Treasurer.

CASE SCHOOL CAMERA CLUB.

CLEVELAND, O.

At the regular meeting of the club, held Friday afternoon, February 7th, Mr. Edward A. Phillips was elected a member. The undersigned, after explaining the difference in the manner of making, and in the material used, between the ordinary albumen paper and the aristotype paper, gave a demonstration of the toning and fixing of the latter paper in one solution. One obvious advantage was the rapidity in printing, and the ease with which the print was toned and fixed as well as the fine results obtained, shows it to be the paper destined to supplant the albumen paper in the favor of both the professional and the amateur.

MILTON B. PUNNETT,
Corresponding Secretary.

ROCHESTER CAMERA CLUB.

REGULAR BUSINESS MEETING, Jan. 24, 1890.

President S. H. CROUGHTON in chair. Dr. J. C. Proctor and Fred. Frick were proposed for membership, and W. A. Page and Dr. Weigel were elected to membership. The following committee, having charge of the prize lens donated by the "Gundlach Optical Co.," for competition, were named by the President: E. W. Horne, H. W. Mathews, A. B. Dodge. It was decided that any member paying actual cost of lockers recently put in dark room should be entitled to use of same as long as they remained members. An interesting demonstration of developing by eikonogen followed the business meeting.

REGULAR BUSINESS MEETING, Feb. 7, 1890.

Seventeen members were present when *President* CROUGHTON called meeting to order.

The Committee on Revision of By-Laws gave notice of some changes to be acted on at next meeting. The Treasurer reported balance on hand \$84.50. The thanks of the Club were extended to E. L. Wilson, for copy of "Mosaics." Both of the members proposed at last meeting were elected. T. N. Kondolf was proposed for membership. The club then adjourned to the dark room, where a very satisfactory bromide enlargement was made by the President with the enlarging camera donated by the Rochester Optical Co.

G. R. ADAMS,
Assistant Secretary.

Bibliography.

DIE PHOTOGRAPHIE MIT BROMSILBER-GELATINE UND CHLORSILBER-GELATINE. Von Professor Dr. Josef Maria Eder. Halle: a. S. Wilhelm Knapp, 1890.

THIS handsome and exhaustive volume is the third part of Dr. Eder's complete handbook of photography and the fourth edition of this special part; the first edition appeared in 1880. It consists of nearly 500 pages of large octavo print, with 206 woodcuts. To say that the volume is very complete is but small praise. It is a veritable storehouse of practical photography, enriched by the researches of its author and those around him in the Imperial Institute in Vienna. Our space is too limited to review in detail the whole volume, and we can only give a synopsis of its contents. The book is divided into four sections; the first of these discusses the scientific foundation upon which the gelatine emulsion process rests; the second gives the practice of photography with gelatine emulsion; the third treats of gelatino chloride emulsion photography; and the fourth gives the failures with emulsion plates, and also the working up of wastes and residues.

Each section of the work is full of excellent practical details, and the whole volume is lavishly illustrated with woodcuts of apparatus and processes drawn from every conceivable source of information. Those of our readers who do not understand German lose a great deal in being unable to enjoy this volume; and to our German-reading friends we must say that your photographic libraries will be sadly incomplete without it.

TRAITÉ ENCYCLOPÉDIQUE DE PHOTOGRAPHIE. Par Charles Fabre. Paris: Gauthier, Villars & Fils, 1890.

We have before us the eighth part of this very handsome and complete encyclopedia of

photography. In it are discussed the various kinds of emulsion used in photography, colloid-bromide, gelatino-bromide, and others. Methods for their preparation are given in detail, and everything pertaining to the manufacture of the finished products by a variety of processes is very clearly indicated. This great work in the French language is to be completed in four large volumes, issued in twenty parts. The first volume is now complete, and the part before us is the third of the second volume, or the eighth of the series, twenty parts completing the work, 1,600 pages.

ENCLOSED please find subscription to BULLETIN, which I am always anxious to get.

W. D. ROS, *Arkansas.*

I HAVE taken similar publications, but do not hesitate to pronounce it (the BULLETIN) the best of all. HYNARD S. CYGENS,

New York.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—F. D. S. writes: I saw in the BULLETIN for January 11th, 1890, the pictures made by Mr. George G. Rockwood, and admire them very much. Will you be kind enough to tell me how the snowflake effect is produced, with the flakes in the air or apparently so?

A.—Snow effects are usually produced by spattering the negative with some black pigment. It is best to practice on a piece of plain glass until the desired effect is produced. When applying the process to the negative the latter should be varnished, and in order to keep the face clear just cover it over on the dried varnish with a piece of wet paper while spattering.

Q.—A. B. W. writes: Please answer the following question through the columns of your valuable BULLETIN. I would like to practice at collotype printing. What kind of gelatine is the best to use? What proportion of gelatine, potassium bichromate and water is best? Also kindly tell me the kind of ink and the construction of the roller that will answer? Will a letter copying press serve for the work?

A.—Any detailed description of these pro-

cesses is out of the question in these columns. We can only refer you to books on the subject. "Photo-engraving," by W. T. Wilkinson, is very good. Another good book is "Burton's Practical Guide to Photographic and Photo-mechanical Printing Processes." Both these volumes can be obtained by writing to our publishers. The kind of ink will depend upon the character of the paper upon which the prints are made. Any lithographic ink maker can give you this information and supply you with the proper ink. A letter-copying press will do for experimenting, if used with care.

Q.—H. L. B. writes: Will you please tell me through the BULLETIN if the following toning bath can be kept from week to week? If so, please give me directions for same:

Tungstate soda.....	45 grains.
Chloride of gold.....	1½ "
Water.....	10 ounces.

Also, what effect would it have on the tones to use one half the quantity of gold? And what effect would it have on the prints to add a small handful of salt to every four quarts of fixing bath?

A.—We have never used this toning bath, but, judging from the nature of tungstate of soda, we should think the bath would not keep, and should be used on the day that it is made. Perhaps one of our readers may be able to help you from personal experience. The effect of salt in the hypo bath is to keep the prints from blistering, but it is better to use it in a separate bath and soak the prints in it after toning.

Views Caught with the Drop Shutter.

THE HOTEL AT ARROWHEAD SPRINGS, San Bernardino County, California, is provided with a first-class dark room for the use of travelers.

Mr. SAM. C. PARTRIDGE, the well-known photographic merchant of San Francisco, has changed his place of business from Commercial street to 226 Bush street in the same city. He found his old quarters much too small for his increased business, hence the change. We must congratulate Mr. Partridge upon his well-deserved success, and hope his new quarters will soon be found inadequate also.

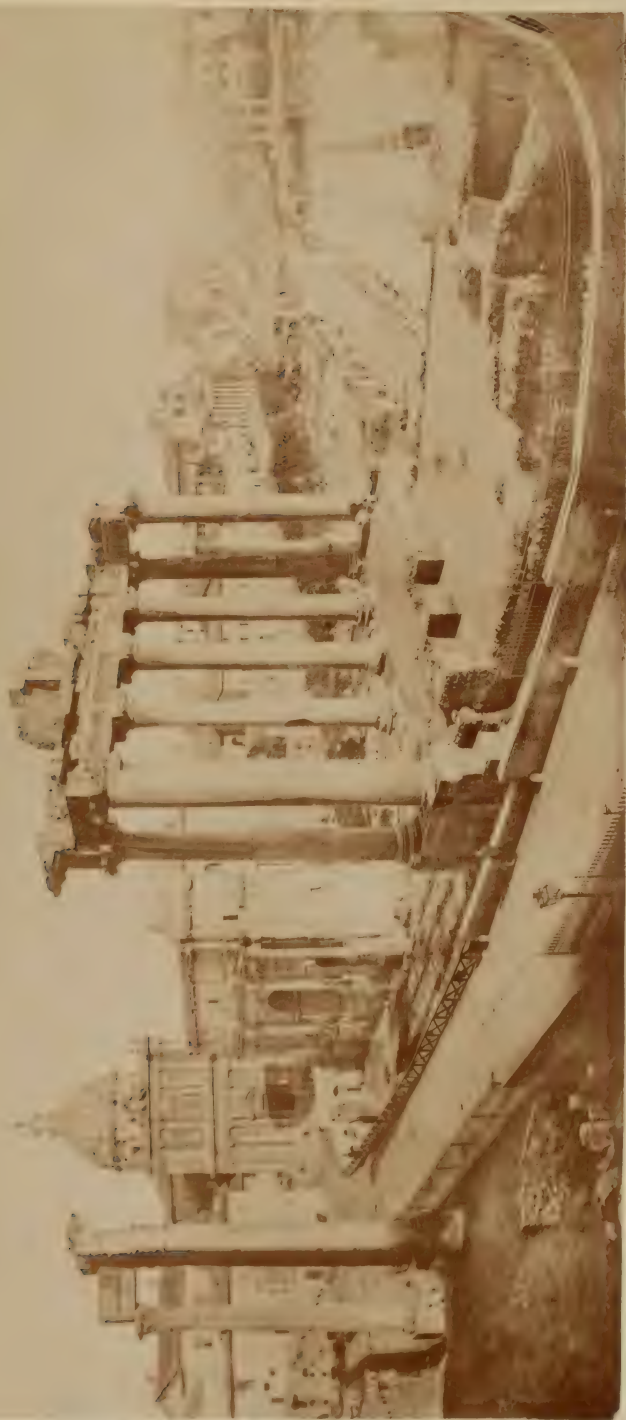
WE regret to note the death of Mr. CHARLES W. STEVENS, one of the earliest photographic merchants in the City of Chicago. Some of the most prominent photographic merchants of to-day in Chicago were once associated with Mr. Stevens. He was born "down East" in New Hampshire, and was about fifty years of age. His death was the result of a short attack of influenza. He leaves a wife, son and daughter to mourn his loss, and to these we tender our sincere sympathy in their hour of sorrow.

Mr. CHARLES A. ZIMMERMAN, of St. Paul, Minn.; Mr. C. D. MOSHER, of Chicago, Ill., and Mr. G. H. HASTINGS, of Boston, all gave us a call recently. We were glad to see these good friends, and regret that their stay with us was so short.

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THE ROMAN FORUM.

BY

D. ANDERSON.

AWARDED SILVER MEDAL AT CHICAGO CONVENTION, 1887.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

MARCH 8, 1890.

Vol. XXI.—No. 5.

THE INTERNATIONAL PHOTOGRAPHIC CONGRESS AT PARIS.

WE have just received the official report of the International Photographic Congress held in Paris last August, and it may interest our readers to know some of the regulations adopted for the use of photographic workers, in order to secure definite understanding when speaking or writing of the processes and methods of photography.

The first resolution was to the effect that the Congress recommends the use of the metric and decimal system of weights and measures in all countries; that all solids be expressed in weight and all liquids in volumes; and that chemical and not trade names be used in all photographic works and catalogues.

The second point discussed was the terminology of photographic processes. After much discussion the following changes were adopted: All processes where light is used shall have the prefix "photo" and the termination "graphy," and the special feature of the process shall come between these, thus: Photocollography is gelatine printing; phototypography, from type-high metal blocks, etc. Photogravure is divided into two classes—photogravure in intaglio (or photoetching) and photogravure in relief. All proofs direct from the negative are designated as phototypes, thus: Direct silver proof, direct platinum proof, direct proof by development, etc. The term "platinotype" and all similar words are suppressed when applied to direct proofs.

Upon the question of "Uniformity of dimensions of plates" a normal international plate 18 x 24 centimeters ($7\frac{1}{8} \times 9\frac{3}{8}$ inches about) was adopted. The division 12 x 18 centimeters was also adopted, and the divisions and multiples of 18 x 24 centimeters. In the matter of sizes of lantern slides, the form $8\frac{1}{2} \times 10$ centimeters ($3\frac{1}{4} \times 4$ inches about) was adopted by a vote of 18 to 13. Another size proposed was 9 x 12 centimeters, but was not adopted, because it was thought to be too large.

The screw for attaching the camera to the tripod was also considered, and the following size was adopted. Its diameter shall be 9.5 millimeters, with a thread cut an isocetes triangle of 55 degrees opening, running to the summit, not more than 1.6 millimeters deep, and having a pitch of one-sixth of its height. This is the $\frac{3}{8}$ inch screw of the English system of Whitworth, adopted by the Photographic Society of Great Britain in 1882.

For the attachment of lenses of different sizes to the same camera, a system of universal screws was adopted upon the same system as that mentioned above, and with sufficient play to allow easy working.

The screw flanges for all new lenses made in the future are recommended to be cut with exterior openings having 40, 50, 75, 100, 125 millimeters.

The question of the transportation of sensitive photographic material, as dry plates, films, bromide paper, etc., was also discussed. A special ticket of red color with a black sun was adopted for packages of such material, and the same ticket shall be printed in the language of the sender and also of the receiver; in the latter language also should be the words, "guard from light and open in the presence of the receiver."

A long discussion about copyright in photographs consumed much of the time of the Congress, and as the details are very voluminous we shall pass them in this brief review.

On the question of "Uniformity in the mode of measuring the focal length of objectives," the Congress adopted the regulation that the optician shall give exact figures for incidence and emergence of the light through a lens, and the absolute focal length.

"The period of exposure of shutters and its measurement" was also discussed. It was recommended that the method for the measurement of this period by the vibrations of a tuning fork be adopted.

Upon the question of the "Photometric Effect of Diaphragms," a "normal aperture," equal to one tenth of the focal length of the objective, was proposed, but nothing definite was adopted in regard to the light-value of stops. The numbering of the stops recommended was in simple numbers on a geometrical ration, 2, 4, 8, etc., for the diaphragms less than the normal. As a unit-light for determining the sensitiveness of photographic materials, a lamp burning amyl acetate was adopted, with a screen, using only $\frac{1}{6}$ of a square centimeter of the luminous flame through an orifice cut for the purpose opposite the most intense part of such a flame. This light is placed one meter from the sensitive surface in a box excluding all other light, and the surface is exposed in a series of bands at regular intervals of five seconds. A special plate holder or shield for this purpose should be used in order to avoid fogging unexposed portions of the surface under action. The wick of the amyl acetate lamp is 5 millimeters in diameter and 25 millimeters high. Such is a very brief review of a report that covers seventy large octavo printed pages and is full of suggestions for methodical working in photographic processes.

EDITORIAL NOTES.

At a meeting of the Kings County Medical Society, held in Brooklyn the other evening, Dr. Henry B. Delatour called attention to the use and importance of photography to medical science, especially in the department of surgery. It serves to keep a record of the progress and decline of disease in a far more faithful manner than mere pen notes or the memory of the physician. Dr. Delatour also commended it to the physician as a means of recreation both for himself and his patients, as it gives them an incentive for outdoor exercise that can be obtained by no other method. We heartily endorse the doctor's last statement.

M. COSTANZO GLISSENTI, an Italian experimenter, recommends a preliminary bath of 5 per cent. solution of bisulphite of soda as an accellerator for the development of dry plates. His method of procedure is to allow the plate to remain in the first bath for two minutes and then to place it in the regular hydroquinone or oxalate developer, as the case may be. By this treatment plates that give but a feeble image with the ordinary developer, develop to perfect negatives when first bathed in the bisulphite solution. The method is worth a trial.

WE hear from Mr. G. Lewis Holmes, the Secretary of the Niagara County Camera Club, that they have about twenty members and expect to have double the number before long. He also says that the professional photographers of Lockport have offered their studios and dark rooms for the meetings of the club and will help in every way possible. This is a very desirable state of affairs and we hope it may continue. In many of our smaller cities and towns such an arrangement should prove successful and a mutual benefit to all concerned, especially if amateurs will be truly such and not make the art a kind of side issue in a business way.

IN regard to the matter of flash powders, we must continue to protest against the use of any magnesium powder that contains any oxidizing material added to facilitate the combustion of the metal. Those of our readers who think we are too severe upon these powders should read the little pamphlet on "Flash Powder Explosions" written by Dr. Charles Mitchell, of Philadelphia, in which the author states that *all forms of flash-powders are dangerous*. And we know of a number of minor accidents that have never been reported in the journals, where burnt hands and faces testify to the extreme danger attending the use of all flash powders except those made with pure powdered magnesium metal alone.

AT a meeting of the Société Française de Photographie M. Thil exhibited a series of photo-micrographs of thin sections of various woods, and showed that it was practicable to classify plants and trees from these pictures. Here is a line of systematic work for some of our American photo-micrographers, especially amateurs, and one full of interest and usefulness. America has always been noted for the beauty and variety of her timber trees.

DR. W. J. NICOL gave the following formula for the production of "kalotypes" at a recent meeting of the Birmingham (England) Photographic Society. The paper is coated with a solution containing :

Ferric oxalate.....	5 per cent.
Ferric tartrate.....	5 "

and, on exposure, the ferric salt is reduced to ferrous salt. It is then developed with—

Potassic oxalate.....	10 per cent.
Nitrate of silver.....	1½ to 2 per cent.
Ammonia.....	Sufficient to clear.

The print is developed by *floating*, the same as in platinotype. It is then washed in three baths of—

Ammonia.....	1 ounce.
Citrate of soda.....	1 "
Water.....	1 gallon.

No hyposulphite is needed for fixing.

A most interesting meeting was held at the beautiful rooms of the New York Camera Club on the evening of Monday, February 24th. Invitations were freely issued, and a representative collection of hand and detective cameras was displayed and described to a large and appreciative audience. Among the exhibits of our publishers we noted the Simplex Camera, an improved form of the Lilliput; the P. D. Q. camera, with its wonderfully simple and perfect shutter; the Facile, an English magazine camera, for carrying and exposing a number of plates without opening the box; and the Krugener book camera, a similar instrument to the Facile, but carrying much smaller plates. There were a large number of other exhibits, altogether about fifteen manufacturers being represented, and the collection was perhaps the most complete and interesting that has yet been brought together in New York. We understand that the exhibition was largely due to the energetic and enthusiastic Secretary of the Club, Mr. H. T. Duffield.

WE have received several letters criticizing rather severely the design for the Daguerre monument. The general tenor of these communications is that Daguerre is placed in too subordinate a position, and that the female figure and the sphere are too prominent. In regard to these critics, we would state that we agree with them as far as the published designs are concerned, but we understand that we must withhold our judgment until Mr. Hartley has finished the large clay model which he is now working upon at his studio. This model is soon to be placed on public exhibition in New York, and all interested will have an opportunity to see it. The changes made in the model are: reduction of the size of the sphere, elevation of the sphere, an increase of the size of the head of Daguerre to one and a half life size, and the total height of the monument will be 16 feet from the ground. The full size model in clay will be exhibited, in the afternoon, on March 10th and 11th, at the Holbein studios, 55th street, New York City.

FROM Mr. W. H. Walmsley, of Philadelphia, we have received some photomicrographs, both silver prints and lantern slides, that are exceedingly beautiful. The enlargements are from 15 to 115 diameters, clear, sharp and excellent photographs. The subjects are physiological sections, and whole or parts of insects.

THE Adrian (Mich.) Scientific Society organized a photographic section on February 17th, with the following officers: *President*, Frederick B. Stebbins; *Vice-President*, William T. Barnum; *Secretary and Treasurer*, W. H. Carrier.

The annual meeting of the Hartford Camera Club was held February 10th. The following were elected officers for the year: *President*, Dr. George L. Parmelee; *Treasurer and Corresponding Secretary*, E. H. Crowell; *Recording Secretary*, C. R. Nason; *Executive Committee*, A. H. Pitkin, Elmer M. White, Coolidge Hills, R. W. Curtis, and the President, Treasurer and Recording Secretary, *ex-officio*.

The Frankford (Phila.) Camera Club has recently been organized, being a branch of Wright's Institute. It starts under most encouraging circumstances,

with a completely fitted out dark room and thirty members. The officers are: *President*, George M. Taylor; *Vice-President*, Bernard Smith; *Secretary*, John M. Justice; *Treasurer*, Howard Horrocks.

WHERE TO PHOTOGRAPH.

W. E. PARTRIDGE.

THERE are thousands of lovely summer resorts scattered all over the Eastern States, many of them voted by all visitors to be surpassingly beautiful, yet the photographer, when he takes his camera with him, determined to bring back souvenirs of his summer, finds that his pictures are not attractive. The charming hills become very commonplace. A quiet stretch of water ruffled by a passing breeze is not enough to make an interesting photograph. The places are pretty, but are without any element of the picturesque. Pictorially they are utterly insipid.

I trust, therefore, that a few notes on a really picturesque country where good things abound will be welcomed by amateurs. The east shore of Lake Champlain, from Vergennes to Burlington, is the heart of the most surpassingly beautiful and picturesque region in the whole of the Eastern States, excepting only a part of the coast of Maine. The richest and most picturesque locality is at Thompson's Point, directly opposite the famous Split Rock and Split Rock Light.

The country is fortunately within easy reach of New York City, New England and Central New York. The tourist from this city goes northward from Albany by way of Saratoga to Rutland, and from thence reaches his destination by way of the Vermont Central. Or he may reach Rutland by any of half a dozen other lines. If the boat is preferred he may go to Ticonderoga and thence up the lake to Burlington by steamer. Along the line of the Vermont Central there are many places where he may stop and use his camera to advantage on his way northward if he comes by rail.

To those who use the canoes there are joys and pictures of which other mortals can only dream. They can sail up the Hudson and go through the Champlain Canal. This canal is almost an unexplored region and is a perpetual delight to the artist. The lake, from Whitehall to Ticonderoga, and the great south bay near the former town, are as unknown photographically as the heart of Africa. And, moreover, they are full of pictures. Whitehall itself is well worthy of investigation. It is not like any other town in New England. A seaport set upon shelves on the mountain sides is a novelty. Forenoon and afternoon, noontide and evening, all present the best of lights. Even the man without a boat might find it worth while to leave the train and spend a day or two with this quiet, sleepy little town on the hillsides.

Just beyond Rutland there is another town or village worth a day's visit. As the trains do not always make close connections at Rutland, the stop may be made there and an excursion made to Proctor, or Sutherland Falls, as it was formerly called. The distance is perhaps five or six miles.

At this point the Otter Creek plunges down over a ledge of rock upwards of a hundred feet in about the same horizontal distance. Among the things which the tourist will wish to have are the falls from above, and below, stretches of vine-covered river banks, the view down the valley of Otter Creek (looking

north), and the marble quarries. In the marble yards, the mills, etc., there are no end of good things to be found for the hand camera. The station is in the midst of them. And they are so compact that one can walk from end to end of them all in ten minutes. Good things are on every hand. It is almost impossible to go astray. And there is an air of novelty about the whole place which is very attractive and makes the pictures especially interesting.

The view down the valley from the falls, including the village of Pittsford, will test the amateur's ability to get distant mountains, villages, broad meadows and vigorous foreground all upon one plate, and with printing density. For this the afternoon or evening light is the best. A whole day can be well spent here, and a week would not exhaust the points of interest which can be reached in half an hour's walk from the station.

The valley of Otter Creek from here northward is charmingly beautiful, and if one had unlimited plates, is worth exploration. North Ferresburgh is the goal, however. The village is at a distance from the lake, and though it contains many pretty bits, is not worth spending time upon if the visit is to be short. But before leaving one excursion should be made to the base of "Mount Philo." Here, looking west, a panorama should be taken of the lake, the Adirondacks stretching away for a hundred miles, and the fertile Champlain Valley for a foreground. The drive up over the low foot hills to the base of the mountain gives a series of the most beautiful and grandest views to be found in our country. It is far finer from the artistic standpoint than that from the hills behind Burlington.

Using the hotel as headquarters, the next spot to be reached is Thompson's Point. This is a summer camping ground, where people from all parts of the country have cottages and tents. The "Point" belongs to the town of Charlotte. Note the fact that the name is pronounced Shalott, with the accent on the last syllable. It is a part of the "town farm," and the ground is not sold, nor even leased. People obtain permission to occupy the ground or build cottages from the Selectmen, and are tenants at will, or for so long a time as they obey the regulations.

The hotel keeper at North Ferresburgh can furnish the necessary transportation, and once at the "Point," it is not difficult to make friends, with whose aid the remainder of the undertaking is easy.

The first view to be taken is of a gorge or clove near the end of the "Point." Best time, morning. A view looking out into the lake is very satisfactory. If the water is low, go down to the beach at the bottom. It is worth three plates at least. Through the woods to the north shore of the "Point" will, in eight or ten minutes, bring one to a vertical bluff whose headlands will account for half a dozen plates.

If a boat can be borrowed or hired, start from the little steamboat dock and go around the "Point" toward the north. One cannot go fifty strokes without finding something which is well worth a plate. In times of low water a half-submerged rock off the lower end of the "Point" affords a rest for the tripod and "standing room only" for its owner. But the view toward the north is worth all the trouble it takes to obtain it. The larger the plate the better. Use a small stop, go in the morning, and if possible get Steamboat Island and its mate clean enough to print. During the past year the water has been very high and the rock has been entirely covered. There are several little beaches only accessible by

water that should be visited for the sake of unique views to be had from them. Gnarled trees and rocky headlands, with glimpses of the lake, are some of the characteristics.

One can easily make a dozen exposures, and then come back the next day and make as many more. The changing light constantly suggests new pictures and new points of view. A panorama across the lake is very nice, and if made with a long-focus lens is picturesque.

But no matter how much one may be enamored of the "Point" he must not fail to make a trip across the lake to Split Rock. 'Tis said the distance is a mile, and it seems but half as much. Two views of the rock—one of the light-house and a panorama of the Vermont shore with the long-focus lens. In the afternoon, when the steamer is going up, she makes a pretty incident in the open space beyond the rock. Take a day for the trip and come home happy and tired.

Here is richness, but the field is not exhausted. The work is only begun. An excursion by boat to the mouth of Little Otter Creek should not be omitted. The island opposite the mouth on the way over is worth a plate, and so are the pond-lily beds. The scenery at the mouths of the three streams that enter the lake at this point is very different from anything in the neighborhood of the "Point."

The mouth of Otter Creek is a mile further south. It is, like all the other streams coming into the great bay south of Thompson's Point, well worth exploration. The whole of the great shore line will well repay a cruise around it.

But the artist who has not time to explore will find abundant subjects wherever he directs his instrument. If, on the other hand, he has time to make studies, seek the rarer combinations, and go to the more distant or difficult places, the rewards obtained seem boundless.

One of the most satisfying things about a collection of photographs made in this neighborhood is that they are not like the pictures usually found in the landscape photographer's album. They have a charm of novelty as well as intrinsic value which is delightful. As pictures they attract the attention of the artist.

Of the old City of Vergennes something should be said, and also of beautiful Burlington. Neither of them, however, has the same photographic charm as the lake shore. Yet both of them will repay a week or more investigation with the camera. But both can be explored in the usual way, and the good services of one's host are not needed in obtaining boats and transportation.

I have some twenty negatives of the Champlain shores, taken within a distance of a mile or two. My only regret is that I have not seventy-five more taken in the same charming region. I have not been able to get a negative of the strange, steamer-like little islands both north and south of the "Point," nor have I photographed the depths of the beautiful bays whose park-like shores stretch away for miles beyond and within the bold headlands.

Champlain, the artistic, is easily the grandest, most picturesque, most beautiful, most satisfying and most fascinating body of water on the North American Continent. Every amateur photographer in the land ought to be among its life-long devotees.

All communications for the columns of the BULLETIN should reach us on Monday preceding the day of issue, to insure their publication at that time.

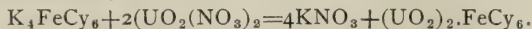
THE CHEMISTRY OF URANIUM AND ITS SALTS AND THEIR BEHAVIOUR IN PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

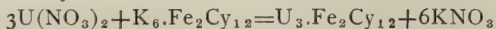
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PHOTO-CHEMICAL ACTIONS.

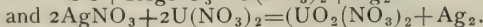
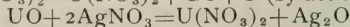
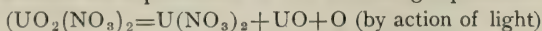
THE first application of uranium to photography by the action of reagents on the uranous compounds formed by the agency of the solar light on the salts of uranyl are due to Mr. C. J. Burnett. In his remarkable communication to Sutton's "Photographic Notes," in 1857,* Mr. Burnett states that his first experiments were made on paper with potassic ferricyanide, by treating it, after exposure, with a solution of uranyl nitrate, whereby he obtained proofs of a rich chocolate brown color. The rationale of this process is the reduction of the potassic ferricyanide to ferrocyanide, which forms a precipitate of uranyl ferrocyanide by substitution, thus :



Mr. Burnett found that this process did not yield uniform results, and consequently reversed the mode of operating; that is, he prepared the paper with a salt of uranyl and developed the impression by floating on a solution of the ferricyanide. The reader understands that in this case the process is based on the reduction of the uranyl salt to uranous, which forms a brown precipitate with the potassic ferricyanide :



The paper prepared with uranyl nitrate dissolved in collodion and developed with argentic nitrate, gave also remarkable results in the hands of Mr. Burnett. The chemical actions are represented in the following equations:



By adding tannic or gallic acid to the silver nitrate solution a very intense black is obtained, and by using the organic uranyl salts—citrate, tartrate, lactate, oxalate—the sensitiveness of the photo-film is much increased. It is well-known that in every photo-chemical action the organic substances are a medium to hold the metallic salts; or used as sub-strata, act as reducing agents.

Ferric and chromic salts are reduced even in the dark under these circumstances, and render certain organic matters, gelatine for example, quite insoluble. The salts of uranyl behave in a like manner.

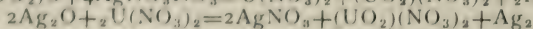
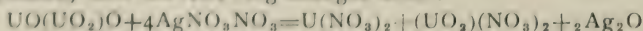
In the case of gallic or tannic acid added to the argentic nitrate—the developer—the black precipitate results :

First.—Probably from a greater layer of metallic silver deposited by the affinity of the metal in a nascent state of reduction for that precipitated in the primary action ; and

Second.—From the action of these reagents on the uranyl salt resulting from the oxidation of the uranous salt.

Uranyl sulphate is often employed instead of the nitrate. The reduction under the influence of light and the chemical actions are similar.

With uranyl oxalate, uranoso-uranic oxide is formed by exposure to light, as before explained, then the following changes arise :



* Reprinted in Humphrey's Journal, Vol. ix, p. 81.

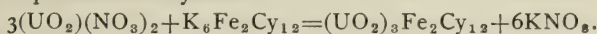
The most important process based on these pho-chemical actions is that of Mr. Worthly. A true account of it was never published by the inventor (?), but it, or a similar one, was well described by "X,"* and specially by Mr. Henry Cooper, Jr., in a paper read before the London Photographic Society at the meeting of December 6, 1864.† The latter process is substantially as follows:

Thirty grains of uranyl nitrate are dissolved in one ounce of a mixture of ether and alcohol, 3 : 2, and the solution neutralized with a few grains of soda. When settled, the clear liquid is decanted, and for every ounce of it five grains each of silver nitrate and of pyroxiline are dissolved.‡ A sheet of paper superficially well sized with arrowroot is coated with this collodion, allowed to dry in the dark, exposed, washed in a dilute solution of sulphuric acid, 1 : 30, until the image stands clear and the high lights perfectly white, when it is toned in a sulphocyanate gold solution, and then washed in water three times renewed, which completes the operation. The photographs thus obtained are permanent. They consist of metallic gold and of a very small quantity of silver.

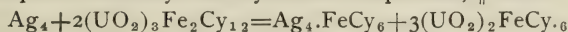
Among the other processes, that published by Dr. Diamond in 1870 is remarkable for its simplicity. A sheet of paper sized with gelatine or arrowroot is floated for two minutes on a solution of thirty-five grains of uranyl nitrate and ten grains of cupric nitrate—also neutralized—to the ounce of water, dried, exposed, developed on a 1 : 12 solution pottassic ferricyanide, then washed to dissolve the soluble salts, and—that is all.

The chemical actions giving rise to the formation of the uranium and copper ferrocyanides, of which the image is in this process formed, are quite complicated. Under the luminous influence the uranyl salt is first reduced, then the uranous oxide acts on cupric nitrate as on the argentic salts, forming cupric oxide, which is finally reduced to the metallic state. This metal now converts the ferricyanide into ferrocyanide, which by another action forms both cupric § and uranyl ferrocyanides.

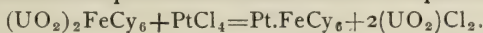
The intensifying and toning process devised by Mr. H. Selle (1865),|| now recommended for gelatine negatives and transparencies, consists of treating the *cliché* with uranyl ferricyanide prepared by mixing a solution of uranyl nitrate with another of potassic ferricyanide :



On the application of this the silver is converted into ferrocyanide, and the red brown precipitate of uranyl ferrocyanide is deposited, ¶ thus :



This reduction turns violet by treatment with a plain solution of gold terchloride—the applications are obvious—and that forming the photo-image obtained by Dr. Diamond's process becomes black with platinum tetrachloride :



**British Journal of Photography*, 1865. Reprinted in Humphrey's Journal, Vol. XVI, page 355.

†Humphrey's Journal, Vol. XVI, page 279.

‡This collodion is quite sensitive. It should be prepared in small quantities and kept in the dark. It is important that the uranyl nitrate contain no uranous salt, else the argentic nitrate would be precipitated.

§ Cupric ferrocyanide is red purple, and insoluble.

|| Bull. Belge de la photographie.

¶ The intensity—or coloration—can be controlled by using a dilute solution and allowing it to act more or less. The normal solution is prepared thus :

Potassic ferricyanide.....	10 grains.
Water.....	1 ounce.
Dissolve and add to uranyl sulphate or nitrate.....	10 grains.
Water.....	1 ounce.

The solution does not keep.

Uranous Salts.—They are green and exceedingly oxidizable. Nitric acid, even in the cold, transforms them into uranyl salts. This oxidation is easily detected by the color of the solution, which from green passes to yellow. They reduce the ferric, cupric, mercuric, argentic, auric and platinic salts either to a lower state of oxidation, or precipitate the metal, being themselves transformed into uranyl compounds.

Reagents act as follows in their solutions :

The alkalies and ammonium hydrate produce a red brown precipitate of uranous hydrate, which in the air becomes yellow from formation of uranyl hydrate.

The alkaline carbonates produce a green precipitate soluble in excess.

Hydrogen sulphide produces no precipitate in neutral solutions.

Ammonium sulph-hydrate produces a black precipitate of uranous sulphide.

Oxalic acid produces a grayish-green precipitate of uranous oxide.

Potassium ferrocyanide produces a light-brown precipitate.

Uranyl Salts.—The uranyl or yellow salts are sensitive to light, which deoxidizes them in presence of alcohol, ether and organic matters.

The alkalies, ammonium hydrate and their carbonates, produce a precipitate of uranate soluble in alkaline carbonates and deposited by boiling.

Hydrogen sulphide produces a black precipitate of uranyl sulphide.

Potassium ferricyanide produces no precipitate.

Potassium ferrocyanide produces a red brown precipitate.

Potassium cyanide produces a yellow precipitate soluble in excess.

Tannin produces a dark-brown precipitate.

[From Photographische Wochenblatt.]

HOW TO OBTAIN THOROUGHLY CLEAR GELATINE NEGATIVES.

BY DR. J. SCHNAUSS.

ALL who are occupied with photo-lithography or photo-zincography undoubtedly would like to return to the good old time of wet collodion photography, as thoroughly clear negatives, whose black parts are entirely opaque, are required for the production of good photo-lithographs, particularly those with reversed negatives.

Practical photographers know very well how difficult it is to obtain such negatives on gelatine dry plates, and in such cases they prefer to return to the old process, by which, using the old solutions—collodion and silver bath—and (according to requirement) acidifying with a little acetic acid, any desired strength and clearness can be obtained. Short exposures are of no consequence for reproductions. But as the preparations for taking a collodion picture are pretty complicated to all whose laboratories and studios are fitted up for the dry plate process, it may not be unwelcome to designate a way by which clear and strong gelatine negatives can be obtained for the above-mentioned purpose without any difficulty. I proceed as follows :

A slow plate should be selected, whose emulsion has not been digested too long and which contains a little iodide of silver; ammonia emulsions should be avoided. Rapid plates will do in case of need, but they are not so good.

As developer I recommend above all hydroquinone. The formula is indifferent, only caustic potash must be avoided. Carbonate of soda is best, with

not too little sulphite of soda and rather more water than ordinarily mentioned in the formulas, as it is of particular importance that the development should proceed slowly. The apparatus and dark room must be thoroughly light tight. Old hydroquinone solution should always be applied, and if bromide of potassium has not been added intentionally, this—or bromide of sodium—will form during development; the bromine, liberated by the reduction of the bromide of silver, uniting with the alkali of the carbonate. Thus, as well as by the partial oxidation of the hydroquinone, its reducing power is weakened, and the process of the appearance of the latent picture is slackened, but this is desirable for the clearness and strength of the negative. Patience, of course, is required, and a sudden appearance of the picture must not be expected as in other cases when fresh developer is applied. If the tray has an even bottom and is placed horizontally, the plate, in at least 1 c.m. depth of developer, may be left to itself by covering the tray with a board and examining it only from time to time. But if the solution is not deep enough, or the bottom of the tray is uneven, so that parts of the plate are not sufficiently covered, then it should be constantly rocked.

The development has to be continued—provided the plate has had proper exposure—as long as the black parts remain clear upon the white ground of the bromide of silver; the latter must not appear black, as is generally the case, and which can be observed in negatives with ordinary and fresh developer. The plate is taken out, well washed, and placed in a fresh hypo-fixing solution, to which has been added a teaspoonful of sulphite of soda (to each $\frac{1}{2}$ liter solution) dissolved in water and mixed with three drops of sulphuric acid. After complete fixing the picture is clear, but generally not dense enough in the black parts. It is intensified, therefore, after good washing, in the usual manner; the simplest way is with bichloride of mercury and ammonia. Both solutions must not be flowed on, but the plate should be completely immersed and remain each time in the solution until complete action has taken place. Good washing is, of course, a subsequent necessity. If the gelatine film should frill or strip, the intensifying process should be commenced with an alum bath, but it is required very seldom if the plates have been left to dry after fixing.

This method to obtain negatives free from fog is to be recommended to all beginners and amateurs. By experience they can easily find out the necessary modifications afterwards.

THE SILVER PRINTING BATH.

BY CHARLES L. MITCHELL, D.D.

[Read before the Photographic Society of Philadelphia.]

In the sensitizing of paper for the purposes of photographic printing, the exciting or sensitizing bath is one of the most important features of the process, hence a few notes concerning its preparation and preservation may not be out of place.

The usual method of making paper of any kind sensitive to the action of light is, after having previously impregnated it (or “salted” it, as it is termed) with an alkaline chloride, to float it for a varying length of time on a solution of silver nitrate. This solution is called the silver “bath,” and consists of silver nitrate dissolved in water, with or without the addition of other substances, the strength of the solution varying from 35 to 60 or 70 grains of the nitrate to the

ounce. The precise strength necessary to produce the best results depends upon the amount of chloride used in salting the paper, but for the several brands of paper now found in the market, both plain and albumenized, a strength of 50 grains of silver nitrate to the fluid ounce of water will be found to be a safe average.

Silver baths may be divided according to their composition into three classes.

The first class comprises such formulas as direct the use of only the silver nitrate and water. A bath made according to this plan, and containing from 50 to 60 grains of silver nitrate to the ounce, is used at the present time by a large number of professional photographers, and is capable of producing excellent results. It is not apt to discolor with use, and by occasional purification, as afterwards to be described, will last for a long time. It should be kept slightly alkaline in reaction, as the presence of free acid would be apt to act injuriously on the paper. This can be done by the occasional addition of a few drops of ammonia, or, still better, of a small quantity of a strong solution of sodic carbonate. The resulting precipitate of silver carbonate soon settles to the bottom of the vessel, and tends to keep the bath clear by carrying down with it any floating organic matter.

The second class is represented by the old ammonio-nitrate bath. This was formerly in great favor among photographers, and, although to a large extent superseded, still has some great advantages, particularly when used in the preparation of silver prints on plain paper. It is prepared as follows: The silver nitrate is first dissolved in the proper quantity of water; two thirds of this solution are then placed in a separate vessel, and strong ammonia added, drop by drop, until the precipitate of oxide of silver at first formed is completely dissolved; the remaining third of the solution is now added, and as this causes a slight precipitate again, pure concentrated nitric acid is added cautiously, drop by drop, until this precipitate is just re-dissolved. Although increasing the sensitiveness of the paper and deepening the intensity of the prints, this bath is apt to more easily discolor with use than the previous bath, owing to the separation of free organic matter and albumen from the paper. For prints on plain paper, however, it is particularly adapted, and will give results not equaled by any other method, the prints having a rich velvety appearance. Paper sensitized on this bath does not need to be fumed.

The third class comprises baths which, in addition to the silver nitrate, contain also an alkaline nitrate, such as the ammonium, sodium or potassium salts. These salts act as absorbents of free chlorine, and also serve to prevent the paper from becoming excessively dry in hot weather. The following formula may serve as a type:

Silver nitrate.....	60 grains.
Ammonium, or sodium nitrate.....	60 "
Water	1 ounce.

Render slightly alkaline with carbonate of soda, or with ammonia. A few grains of alum are also sometimes added for the purpose of preventing blisters. This bath gives excellent results with albumen paper, and for this purpose is probably to be preferred to either of the preceding formulas. For plain silver prints it is much inferior to the ammonio-nitrate bath, and the prints seem to lose considerable strength during the preliminary washings before toning. Paper sensitized in this bath also requires to be fumed before printing.

In sensitizing albumen paper in these different baths, the paper should always be "floated," as it is termed, an operation sufficiently familiar to all photographers to require no description. Plain paper may be either "floated" or the paper may be laid flat on a clean sheet of glass, and the sensitizing solution applied to the salted side by means of a clean swab of cotton flannel, or a camel's-hair brush.

It may be remarked here that paper sensitized in either a bath of the first or the third class should always be fumed; with those of the second class it is not necessary. In printing, also, the sensitized paper from the former must be printed much more deeply, as they seem to lose a great deal of intensity in the subsequent washings. In the preparation of plain silver prints with the ammonio-nitrate bath, the writer has found such a small percentage of silver in the wash waters that but a slight reaction would be given to the ordinary tests of silver, thus showing that nearly all of the silver salt remained fixed in the paper, and consequently tended to deepen and intensify the print.

Having now briefly discussed the different forms of the silver sensitizing bath, it remains to say a few words regarding its care and preparation. First, as every sheet of paper sensitized robs the bath of so much silver, its loss must be made good, or in a short time the bath will cease to work properly. The bath must therefore be strengthened from time to time, and this is generally done after each day's work by adding an amount of fresh nitrate of silver corresponding to the quantity abstracted from the bath, thus maintaining it of a uniform strength. The usual practice is to allow about fifty grains of silver nitrate for each sheet of paper sensitized, and if the amount of silver corresponding to the number of sheets used is dissolved in a few drams of water and added to the bath, and then the bath exposed to the light for a while, it will continue to work satisfactorily for a long time. The hydrometer is also used for determining the strength of the bath, it sinking to certain marks corresponding to the number of grains of silver nitrate in each ounce of the solution. This answers very well for a solution of silver nitrate in pure water, but as the bath soon becomes contaminated with soluble salts and organic matter, the density of the solution increases, and the readings of the hydrometer in consequence soon become incorrect. The chief source of contamination to the bath is from organic impurities carried into it from the paper, in time causing a brownish or reddish discoloration of the solution. This must be removed, since paper floated on such a bath is unevenly sensitized and darkened. Several methods of purification have been proposed. One is to add a small quantity of kaolin to the bath, which is then well shaken up and allowed to stand in the sun. The organic matter is carried down by the kaolin as it subsides, and, after filtration, the bath is again ready for use. Another method is to add a small quantity of a strong solution of potassium permanganate to the discolored bath, and decompose the organic matter by its oxidizing properties. This is immediate in its action and quite effective, but is open to the objection of introducing extraneous salts into the bath. Another plan is to add a few drops of hydrochloric acid, or still better, a small pinch of salt, and the chloride of silver thus formed, in settling to the bottom of the vessel, carries all impurities with it. The best method, however, is to add a small quantity of a saturated solution of sodium carbonate, and then set the bottle containing the bath in strong sunlight. The action of the sunlight oxidizes the organic matter, and the carbonate of silver formed carries it down as it settles to the bottom of the bottle.

Should it, however, be found impossible to purify the bath by this means, the next resource is to the process of "boiling down," as it is termed. A porcelain capsule, or still better an enameled iron dish of convenient size, having been procured, the refractory bath is poured into it, and then placed over a gas stove and gently boiled down to dryness. The heat is then increased until the contents of the dish are in a state of fusion and completely liquefied. The heat is continued for a short time until all organic matter has been thoroughly carbonized, and then stopped, and the dish and its contents allowed to cool, the latter dissolved in distilled water and filtered. The filtrate is then made up to the original measure of the bath with distilled water, and a dram or two of fresh silver nitrate added to make up for waste and loss.

It happens, however, in course of time that the silver bath becomes so clogged up with soluble salts, such as the ammonium, sodium and potassium chloride and nitrate, resulting from the chemical reactions occurring during sensitizing, that the bath will no longer work. It must, therefore, be set aside, a new bath prepared, and the silver recovered from the old bath.

If the bath has been made according to the first or third class, all that needs to be done is to render the bath acid with nitric acid, and then add a strong solution of washing soda until the white precipitate of carbonate of silver ceases to be formed. This is allowed to settle, the supernatant liquid poured off, and the precipitate washed repeatedly until the washings are free from color, and all soluble salts have been removed. The precipitate is then drained on a filter, and the moist mass, filter and all, is placed in a dish of porcelain or enameled iron and dilute nitric acid (one-tenth of water) added until effervescence ceases and the white precipitate is nearly entirely dissolved. This solution is then filtered and evaporated, first to dryness, and then heated to calm fusion and allowed to cool. The resulting semi-crystalline mass may be considered as pure silver nitrate, and when weighed will indicate what amount of water is to be added to form a bath of the proper strength.

If the old silver bath, however, is prepared according to the ammonio-nitrate formula this method will not answer, as in the presence of the ammonia salt not all the carbonate of silver can be precipitated. The best plan is, therefore, to acidify the bath as before with nitric acid, and then add salt until all the silver is precipitated as chloride. This should be well washed, collected on a filter and dried. It may then be converted into pure metallic silver by fusing it in a crucible with powdered charcoal and nitrate of potassium, or it may be placed in a vessel containing dilute sulphuric acid (one-twentieth or one-thirtieth of water) and metallic zinc added. Metallic silver will be precipitated in a very finely divided state and the zinc dissolved. From this silver the nitrate can be prepared by dissolving it in dilute nitric acid and then proceeding in the same manner as described for the carbonate of silver.

[From the British Journal of Photography.]

THE NEW BENZOLINE LIMELIGHT.

BY ALBERT W. SCOTT.

II.

DURING the past year I have been engaged in experimental work having for its object the production of a more powerful limelight than was previously known. I was instigated thereto in the first place by a letter received from a

gentleman whose name and skill in certain branches of science are, doubtless, familiar to the readers of this journal. This scientist, having read articles written by me for these columns in former years on limelight matters, applied to me for the loan of my best mixed gas jet, with the view of comparing it with the best jet in his possession. I was informed of the results of the tests applied to these jets, which showed no perceptible difference in illuminating power—a result I fully anticipated, as they were constructed on the same principle, though differing in design.

The correspondence so begun has continued up to the present period—I devising and carrying out experiments, and he, on his part, criticising these as reported, and suggesting a few ideas of his own.

At first the construction of the nipple was discussed. It was found possible, with oxygen and coal gas, to get a noisy light of 800 candles with an extreme pressure of gas; but, on the whole, little or no advance was made in this direction.

The correspondence then ceased for some weeks. In the interval I designed certain complicated machines for boiling benzoline, with the view of replacing coal gas by the steam of benzoline, the theory being that benzoline would allow a larger bore of the mixed gas jet to be used, and, by consuming more gas, enable a better light to be obtained. An apparatus, constructed of brass tubes brazed together, was made for this purpose, but was never actually tried. I did not like the principle on which it worked; it seemed dangerous, as there was a possibility of the liquid boiling over and causing a conflagration, so the apparatus was eventually destroyed.

From a consideration of the cheap benzoline lamps sold by ironmongers, which are always stuffed with cotton wool, the idea occurred to me of making a boiler stuffed with wool and introducing air-tubes in the stuffing to allow the steam to escape. Such a vessel was soon made in tin. In order to apply the heat in an equable and safe manner, a hot-water bath was adopted; the stuffed benzoline vessel was placed within it after being filled with benzoline, the surplus fluid not absorbed by the stuffing being drained off. A spirit-lamp was placed under the water-bath, which was made on the glue-kettle plan.

The apparatus being in readiness, the spirit-lamp was lit, and the water raised gradually to the boiling-point. Having been the victim of an explosion with an ether saturator some years previous, I took the precaution of placing a substantial shield between this apparatus and my body, the security of the latter article being considered of great importance. With some degree of trepidation I applied a light from time to time to the open tubes from which the benzoline steam was expected to issue forth in torrents.

The steam, however, was very slow in making its appearance, so the heat was increased until the water was in brisk ebullition. At last a tiny benzoline flame was burning at the tip of the tubes, a flame half an inch high, and which any little candle could put to shame, so far as illuminating power was concerned. It was quite clear that the apparatus, regarded as a boiler, was a failure.

It remained now to try it as a saturator. Before warming the vessel containing the benzoline it was found, on blowing through the air-tubes, that the air picked up sufficient vapor on its journey through the stuffing to become inflammable, and to give a blue flame a foot long when lit as it issued from the vessel.

On repeating the experiment with the vessel placed in warm water, it was

found that as the temperature rose the amount of vapor imparted to the air increased very rapidly, so that at a heat of 100 degrees Fahr. a flame thick and smoky, and three, four, or five feet in height, was easily obtainable, simply by blowing through the tubes with the breath. Clearly the vessel, regarded as a saturator, had qualities worthy of trial. The mixture of air and vapor could not be exploded inside the saturator; the proximity of the moist stuffing seemed a complete flame check. So far there was no "pop" of any kind.

The next experiment was to pass *oxygen* through the vessel instead of air. As the mixture of benzoline vapor with oxygen is five times as explosive as with air, it became desirable to know what would be the result of applying a light to the mixture as it issued from the saturator. The effect was a loud but harmless "pop," due to the explosion of gas contained in the air tubes inside the saturator, amounting to several cubic inches in volume. There was a much larger quantity of vapor interspersed throughout the moist stuffing, but it seemed evident that this was not ignited, owing to the stuffing acting as a flame extinguisher; if it had been ignited the vessel would have been burst with the violence customary when accidents occur with *unstuffed* saturators,

When a length of rubber tube was attached to the exit gas tube of the saturator, and a light applied to the end of this tube, the "pop" was louder, owing to the larger quantity of gas exploded; but still no damage whatever was done to either saturator or flexible tube. It appeared desirable to use a very short tube between saturator and jet—six inches is sufficient.

These experiments appeared conclusive in proving the *safety* of the benzoline saturator. I discarded the shield before mentioned, and lost all timidity in the use of the apparatus. Pops are easily avoided when a jet is used, and, as a matter of fact, I have given some thirty exhibitions with the warm-bath saturator, both outdoors and in public halls, without pop or hitch of any kind.

The apparatus was connected to a mixed gas jet, having a nipple of one-fourteenth of an inch bore, fixed in a single lantern, the rubber tubing been arranged in the manner customary with ether saturators. Oxygen was supplied from a gas bag compressed by two hundredweight. On first lighting, at the jet nipple, the oxygen which had passed through the saturator, and was loaded with vapor, a large flame similar to coal gas was produced. After allowing a minute or two to allow the jet to become warm, which was necessary to check condensation, the oxygen tap was turned on slowly till the light was at its best. It was instantly apparent that the benzoline light was more powerful than the coal-gas light: it appeared to be of double brilliancy, but subsequent tests showed that the improvement was about 40 or 50 per cent. From that time forth I discarded coal gas in favor of benzoline in my practice.

Having contrived this practical though crude apparatus, I reopened the correspondence with my distant friend by describing it. It was not received with enthusiasm; on the contrary, it was attacked by keen criticism, numerous theoretical objections were started, and the improvement in light was doubted. I refuted some of his arguments, others I met by modifying my claims, and others again I endeavored to cope with by altering the apparatus. I have tested the light many times by various methods, while my correspondent, so far as I know, has not yet seen the warm-bath saturator in action. When he does see the light in its full power, I have no doubt he will be convinced of its superiority over coal gas. The critic drew my attention to the fact that benzoline was not a

simple liquid, but was a mixture of several liquids of the same nature, but of different degrees of volatility. He suggested that a fluid which consisted wholly of the lighter constituents of benzoline should be tested. The last hint proved of service.

This correspondence has been very helpful to me by rendering me sensible of the weak points in the new system. The warm-bath saturator (for which provisional protection has been obtained) has been greatly improved since the first one was made; the water bath is replaced by an air bath; the spirit lamp by a night light; and common benzoline by a more volatile benzine. The oxygen, after passing through the saturator, is so heavily loaded with vapor that in the lantern it burns precisely like coal gas; it is practically non-explosive, and is less liable to pop than with any other saturator in the market. Hence, the warm-bath system is the *safest*, and probably will be found suitable for dissolving lanterns, as there is now no condensation of benzine in the tubing.

[From the *British Journal of Photography*.]

PHOTO-MICROGRAPHY.

BY ADOLPH SCHULTZ, F.R.S.E., F.R.M.S.

(Continued.)

I USE an excellent long-focus bellows camera made by Messrs. George Mason & Co., of Glasgow, the focusing screen end of which racks out, and not the front of it, which latter plan condemns a camera for the purpose of photo-micrography. This camera I always fasten with two screws to the platform of my bench, as one screw alone would not suffice to prevent lateral displacement, especially when the front of the dark slide is being drawn out. To prevent any vibrations of the dark slide containing the sensitive plate during exposure, I screw four stays of brass to the front and to the back of the camera, which stays are firmly screwed against two iron rails running alongside of the platform. In the place of the rising front I place a front having a wide square box attached to it, which contains a shutter for timing the exposure. The eye-piece end of the microscope body or the projection eye-piece is inserted through a round opening into the front of this box, and the light-tight connection between camera and microscope is effected by means of a flanged tube, which is lined, and whose flange is faced with black velvet, and which slides over the body of the microscope. Now there is one very important, nay indispensable, adjunct to a photo-micrographic outfit, and one of which almost every camera should be possessed, especially those for copying or for photographing dimly-lit interiors, and that is, besides the ordinary focusing screen containing ground glass, one other such screen containing clear glass. It is needless to say that the inner surfaces of these focusing screens must register exactly with the film side of the sensitized plate. The light on the screen, when images under high powers are projected on it, becomes so feeble that these images are no longer visible through the ground surface, nor are they visible on the clear glass screen unless we place an eye-piece or an ordinary photographer's focusing glass upon it, which has its focus in the plane of that side of the screen which is turned toward the microscope. With this arrangement the image on the clear screen appears as distinct and luminous as it would if simply viewed in the microscope, and all difficulty about focusing under high powers vanishes. The clear glass screen serves simply as a support in the proper place

for the focusing glass. A wooden screen with a number of holes for placing an eyepiece in it is sometimes employed for viewing the image, but this plan is not so good as the clear glass screen. Without such a clear glass screen all focusing with microscopical precision becomes mere chance work. There is another reason which often renders the use of a clear glass screen imperative, and that is when we photograph by monochromatic blue light in order to eliminate, as far as possible, any residue of chromatic aberration of the objective, and to increase its resolving power. The image in this case becomes far fainter than when projected by white light on the focusing screen. Monochromatic blue light is obtained by placing suitable blue glasses between the source of light and the object to be photographed, or a small glass tank filled with an ammoniacal solution of sulphate of copper, which solution must have been filtered; such a tank is often called the cupro-ammonia cell. The employment of monochromatic blue light is especially to be recommended for low powers which are not corrected for photography, because in these the differences of visual and chemical foci are greater than in the higher powers. These differences have to be ascertained by a number of trials for the different objectives, and have to be noted, so that the photo-micrographer knows in future how many turns of his fine adjustment the objective has to be withdrawn from the object after the sharpest possible visible image has been obtained on the screen in order to secure a sharp chemical image on the sensitive plate. Most modern objectives are corrected for photography, and in the apochromatics the visible and the chemical foci coincide, so that they give as sharp chemical images by white light as by monochromatic blue light.

I have now arrived at the last part of my notes, which deals with the *modus operandi* of taking photo-micrographic negatives, and which I purpose to illustrate by photographing a microscopical object. As I am addressing the members of the Glasgow Photographic Association, among whom are many of the foremost professional and amateur photographers of the West of Scotland, and as in the development of the latent image the same rules obtain as in copying or in any other branch of photography, it would obviously be out of place and presumptuous on my part to enlarge on this part of my subject. Should, however, any of my hearers not be acquainted with photography, and desire to give photo-micrography a trial, he will do well to get the late Mr. J. H. Jenning's little handbook on photo-micrography.

The illumination of the object having been carefully arranged, the table carrying the microscope is turned so that the axis of the latter coincides with the center of the camera. I then raise three screws to support and fix the turn-table, and make the light-tight connection by means of the flanged tube. I focus next the image as sharply as possible on the ground-glass screen, and after that on the clear-glass screen, and shut off the light by means of the shutter in the camera front. This done, I insert the dark slide containing the sensitive plate, draw out the front, and after all vibrations have subsided, and the whole apparatus has come to rest, I make the exposure, observing during this time all possible precautions against the slightest vibrations. The exposure completed I close the camera by means of the shutter, push in the front of the plate-carrier, and proceed to development in the dark room.

The length of exposure in photo-micrography is of quite the same importance as in any other branch of photography, and upon it depends chiefly the vigor of

the resulting negative ; but the latitude in the time of exposure by artificial light is relatively considerable. It is impossible to give any definite rule for calculating the requisite time of exposure, as this is influenced by many factors—such as the quantity and quality of the light ; by its distance from the object ; by the condenser, its focus, aperture and position ; by the thickness, nature and color of the object ; by the objective, the eye-piece and its distance from the screen ; by the degree of sensitiveness of the plate used ; by the nature and power of the developer, etc., so that there is here any amount of scope for exercising our speculative faculties, and any amount of chances of going wrong. Experience teaches one sooner or later to estimate the required time of exposure from the quantity and quality of the luminosity of the image on the focusing screen. Dr. E. C. Bousfield has published a brochure entitled, “A Guide to the Science of Photo-micrography,” and in it is given a scale or table to find the time of exposure under different circumstances, and which table is based on the visibility of the figures on Warnerke’s sensitometer under the same illumination and at the same distance from the screen as the gelatino-bromide plate, and used in conjunction with the known scale of the sensitiveness of the plates, either as stated by the maker or tested by the same sensitometer.

Regarding the choice of the plates, the wet collodion plate must be ranked as the first, judging from the results it is capable of yielding under proper treatment, but unless we can photograph by sunlight, the exposures, especially under high powers, become very much prolonged and often impossible. I have had to give, by lamplight, as much as half an hour’s exposure when using so low a power as a one-inch objective. I use now only dry gelatino-bromide plates, preferring, of course, thickly coated ones, rich in silver, and of great, but not of the greatest rapidity. I only use the slow plates when photographing with the lowest powers of the microscope, and when I aim at great density. Among the plates I have used most I can recommend the North British plates, owing to their great sensitiveness and the great density and contrasts they are capable of giving. I also use Paget’s and Thomas’s, but of late I have used many Ilford plates, which I have found remarkably uniform and good. Nor must I forget the isochromatic plates, which are especially serviceable when photographing objects with great actinic color contrasts, such as blue and red, or brown. Dr. Roderick Zeiss recommends those of Perutz. I have also photographed on Eastman’s stripping films with good results.

The developer to be used for photo-micrography ought to possess considerable latitude and power, such as those containing pyro and ammonia, but I prefer a developer containing pyro and a large proportion of sulphite of sodium, which is powerful and suits many brands of plates. In developing a negative one must not lose sight of the purpose for which it is intended, whether for printing positives on paper, or for lantern transparencies; for the latter the negative must be vigorous, leaving, if possible, the ground black. Negatives of photo-micrographs ought not to be retouched, as otherwise they might lose their scientific value and their character of truth. Intensification or reduction of the negative are, as stated already, the only changes permissible under certain circumstances; the former enables us often to dispense with that difficult and wearisome process, the blocking-out of the ground by means of Chinese ink and black varnish, generally resorted to in negatives for lantern transparencies in order to obtain in the latter a ground of clear glass. As pictures, such transparencies

may be very satisfactory, as the object photographed may be printed to any depth desired, but at the same time the clew to the thickness of the object is thereby lost, for the most pellucid object can be made to appear as possessed of great thickness and substance.

Regarding the size of the plates which are most suitable for photomicrographic negatives, it is held that it is on the whole wiser to take sharp small negatives and quarter and half-plate sizes, and to enlarge these afterwards, instead of taking large direct photographs, if large prints are required.

As a photo-micrograph should possess all the detail which we can secure on one plate, it is obvious that for printing positives a smooth paper ought to be chosen instead of one with a rough surface. The making of transparent positives for the lantern is now a pleasant and easy task if we possess good and suitable negatives and such excellent lantern plates as Thomas's, Mawson & Swan's, Fry's, etc. No positive can, microscopically speaking, render all the finest detail of the negative, and in some cases it would therefore be advisable to show the latter on the screen instead of the former.

I have said nothing yet regarding the objects which may be photographed by the aid of the microscope. Suffice it to say that comparatively few specimens or mounted objects will give good photographs, either in consequence of too great color contrasts, or of unevenness of sections, or of uneven embedding in the mounting medium, or of too great opacity, etc. Microscopical objects possess often very transparent and; at the same time, more or less opaque parts apart from their color contrasts, and so it is in such cases unavoidable that the transparent parts appear greatly overexposed, and the opaque parts greatly underexposed in the negative: and unless this defect can be corrected to some extent by the use of isochromatic plates, there seems no other way out of this difficulty. Live objects have to be photographed by the use of the so-called instantaneous shutters and a powerful light. In this case a finder will be found extremely useful, which is a separate microscope body carrying an eye-piece, into which the image is reflected by means of a small prism, so that the operator can seize the favorable moment when the moving object is in the field of view.

With these remarks I bring my notes to a conclusion, trusting that they may induce some of you to begin and pursue photo-micrography, and that they may assist others practicing this most useful and fascinating branch of photography already in overcoming some of the difficulties besetting their path.

THE PHOTO-MECHANICAL PRINTING METHODS AS EMPLOYED IN THE JUBILEE YEAR OF PHOTOGRAPHY.

BY THOMAS BOLAS.

(Continued.)

MR. FRED E. IVES, of Philadelphia, published, in 1878, a method of translating the smooth photo-relief into stipple, and this method may be regarded as a new departure. According to the method of Ives, as described by him in 1878 and patented in the United States, the essential features of his method consist in inking the Woodbury relief, and pressing against paper which has been grained or embossed, somewhat after the fashion of bookbinders' cloth. Under these circumstances, the projections on the paper become completely crushed down by the inked relief where the gelatine is thickest, and a solid black results, while the

more shallow parts of the relief only tip the projection on the paper with ink. Intermediate thicknesses of relief produced a medium effect. You will now please note the effect of pressing this sheet of grained paper against the inked Woodbury relief, a picture in black and white resulting, the shades of the original being represented by the varying extent of the closely packed dots which constitute the picture. The translation into stipple thus obtained may be used as a transfer for putting down on stone or zinc, but if preferred it may be re-photographed. Ives also made printing blocks by casting from the grained surface which had been compressed by the gelatine relief, although these were not found to be quite equal in quality with those obtained by the first-mentioned method. A subsequent modification of Mr. Ives' method gives results much more easily and economically, as he has succeeded in substituting a "swelled gelatine" relief for the more expensively produced Woodbury relief. In a letter to me, Mr. Ives says: "The relief which I now employ is a plaster cast from swelled gelatine, which is secured so easily that an apprentice, seventeen years of age, makes them acceptably for Crosscup and West. On the relief the lines and stipple are impressed by means of a printing film of elastic, V-shaped, stippled lines, in a manner which gives the operator considerable control of the effect. The line and stipple picture on the plaster relief is then stripped off for lithographing transfer or etching, by a method so simple and perfect that it astonishes all who see it done. Formerly, I had to reproduce the impression by photography in the camera, and by this operation could not avoid losing much of the delicacy of the original, which is wonderfully delicate, sharp, and clear in line. I have to secure ruled plates for moulding closer lined printing films before I can apply the transfer method of reproduction for fine work; so it may be months before I shall show you what fine results I can secure in this way."

The following reprint of Ives' original declaration will be of interest:

"ITHACA, N. Y., August 12, 1878.

"I, the undersigned, have to-day invented a method of obtaining relief plates for the typographic printing press, from ordinary photographic negatives, which may be described as follows:

"*First*.—From an ordinary photographic negative, a relief in gelatine, similar to that used in the Woodburytype process, but perhaps in lower relief, is obtained.

"*Second*.—This relief is carefully and uniformly inked with fine printers' ink, and pressed between two flat surfaces (or between rollers) against paper or other material, upon which is stamped or otherwise produced a fine grain or other suitable surface. The inked relief being higher in the black parts, presses down the grain of the paper on the corresponding parts, and the removal of the ink by the paper from those parts of the relief produces a black impression, while upon those parts where the relief of the gelatine is lower, the grained surface is pressed less, and the ink taken up in spots, the size of which depends upon the grain of the paper and the amount of pressure, and producing an effect similar to that of crayon sketches made upon such a surface.

"*Third*.—Relief plates may be made from this impression, either by the usual photo-typographic processes, or, perhaps by obtaining a cast or electrotype of the impressed surface of the paper or other material used to receive the impression from the gelatine relief.

"FRED E. IVES."

The broad principle of the Ives method, which consists in pressure of the relief against a grained or stippled surface, has been the subject of several subsequent patents and inventions. We find that, in 1879, Petit, of Paris, took out an English patent for a method nearly identical with that of Ives, and soon after another patent by Dredge followed; this latter, however, indicating novel methods of working. A process of quite a similar character is the "Crayontype" of Ad. T. Eggis, which was published more recently. Mr. Eggis, instead of inking the relief, takes an inked film, such as manifold copying paper, and lays this on the relief. The grained paper is now placed over and pressure is applied. If the grained paper sold for producing crayon effects in lithography is used, very excellent transfers are obtained.

Mr. Eggis, writing in the *Photographic News*, thus describes the method: "This process gives results good enough to have allowed the taking of a patent, but I find it preferable to describe it for the public benefit. I call it crayontype, for the images it produces are much like those obtained by the artist with a lead pencil (crayon in French). This is how I proceed. I procure or produce, to begin with, a gelatine positive on best plate glass (glacé) obtained by the known ways, in relief. The highest point when dry should not have more than one millimeter. The other necessary implements are, first, grained (or lined) paper, of same kind as is used by the artists for their drawings destined to be etched; second, a few sheets of blue or black transferring paper (*papier à calquer*, thin paper coated with a greasy substance and colored); third, a small press. Having these at hand, I take the gelatine positive, lay it on the stone or metal table of the press; on the relieve I place a sheet of transferring paper, the prepared face turned upwards. On this I lay the stippled or grained autographic paper, face downwards, touching the greased sheet. Over all this I place a fine polished steel sheet, well planed. I put the whole under the press, and slowly pull down the lever in such a manner as to give a smooth and graduated impression. Afterwards separating the whole, I find on the grained paper a good and often a perfect stippled reproduction of the gelatine relief. This reproduction being formed by a greasy substance, I am able to transfer it at once directly on stone for lithographic purposes, or on metal to be etched in the usual manner. The production of such an image will be easily understood; it is much the same as the direct drawing with a pencil on the paper. Instead of the artist pressing more or less his graphite on the paper, the gelatine relief (which corresponds more or less to the lights or shadows of the photograph) presses more or less on the paper, and gives the true gradation of the original. The work of the hand is mechanically imitated very closely indeed. The crayontypes present a different grain, which may be chosen according to the work to be done. It is at least more artistic than the usual regular stippling."

Other modes of effecting the translation of the relief by pressure on grained surfaces have been patented by Mr. Zuccato.

The first method consists in first planing a piece of type metal or similar surface in a series of ridges, or a series of pyramids, as the case may be. The plate is then inked, and instead of pressing the relief directly on the inked plate, a piece of very thin paper is interposed; the relief crushes down the pyramids in proportion to its depth. The pyramid of type metal is spread out, and forms a sharply cut outline on the paper, and in this way a transfer is obtained which has a remarkable clearness of outline, almost like the cleanest cuts of the graver.

It will illustrate the matter better if, instead of inking the plate first, the relief is pressed directly against it, and you will then be able to see the flattening of the lines or pyramids.

Two other modes of working have also been patented by Mr. Zuccato. In one he interposes between the relief and a sheet of transfer paper a piece of gauze, or a piece of silk which has been inked with transfer ink. Of course, what then takes place is similar to what happens in the case of the plate; the threads of the gauze get crushed out to a greater or less extent, and form lines of greater or less width, but this method in which the gauze is crushed down is not nearly so perfect as the method with the plate of type metal.

A third mode of working, which Mr. Zuccato also claims in one of his specifications, is the pressing of the relief upon a lithographic or zincographic surface on which an ink stipple has been impressed. The stipple gets crushed out more or less, according to the extent of the pressure; this, of course, depends on the thickness of the relief.

The Woodburytype process and the Collotype process, not having undergone any very remarkable developments of late, and being generally known as regards their main features, do not need special consideration in relation to our present subject.

TONING ARISTOTYPE PRINTS.

To the Editors of Anthony's BULLETIN:

I HAVE read the remarks of Mr. Duchochois upon combined toning baths for aristo prints with considerable dismay. I have been using a combined bath exclusively for a year or so past, and to find so eminent an authority declare it worthless is discouraging. As aristo paper is coming into such general use, would it not be well to settle this question definitely, before any more mischief, if there be mischief involved, is done?

In my own experience, I would say that I have tried the particular bath referred to by Mr. Duchochois, but have given it up as unreliable. I use the following bath, based upon Liesegang's formula :

Water.....	24 ounces.
Hyposulphite soda.....	6 "
Sulphocyanide ammonia.....	1 "
Acetate soda.....	1½ "
Saturated solution alum.....	10 "

Let stand about two days, and filter. Then add the following solution :

Chloride gold (pure).....	15 grains.
Chloride ammonium.....	30 "
Water.....	6 ounces.

After shaking well, add 40-grain solution lead nitrate, ½ ounce, and shake *thoroughly*.

I desire especially to call attention to the following points :

First.—The function of the alum. This is simply to harden the gelatine of the paper. The bath tones equally well without it, and it may be omitted if a separate alum bath be employed. The disadvantage in so doing, however, is that the gelatine is apt to become finger-marked. In the case of collodion aristo I should omit the alum as useless.

Second.—The functions of the lead salt. This shortens the time of toning from three-quarters of an hour to about fifteen minutes. The final results are indistinguishable whether it be used or not. How it acts I am not prepared to say.

Third.—Previous washing of the prints. I have used this bath with and without previous washing, and cannot see the slightest difference in the results. I therefore omit the washing as unnecessary.

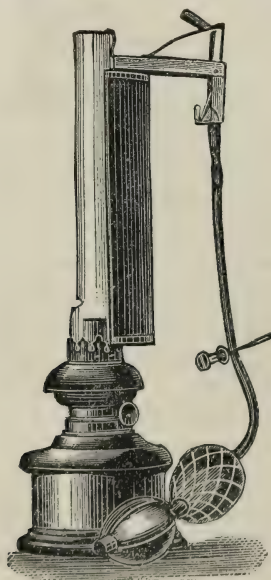
I inclose a print toned in the above bath. If appearance is a guide, I should say that it is gold-toned and not sulphurized, but I am open to conviction. I have intentionally left the print a little warmer in tone than I ordinarily should, to show more plainly the character of the tint.

C. E. VREDENBURGH.

The print is nicely toned, and does not appear sulphurized.—Eds.

FULGAR FLASH APPARATUS.

ILLUSTRATION that was not ready for last issue of BULLETIN. (See page 102.) This cut illustrates the application of the Fulgar Flash Apparatus to any



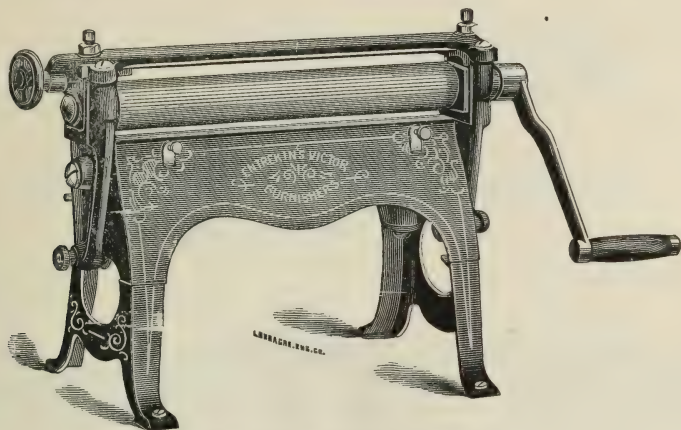
ordinary oil lamp having a chimney, the magnesium powder being blown not in the direction of the hot air and gases from the chimney, but across the current.

OUR ILLUSTRATION.

ONE of the most interesting pictures in the Foreign Exhibit at the Chicago Exhibition of the Photographers' Association of America was a very large print (24 x 48 inches) on albumen paper, of the Roman Forum. This picture was such a handsome piece of architectural photography that we have had it reduced, and present our subscribers with a copy as a frontispiece to this issue of the BULLETIN. It will bear careful inspection, is remarkable for its clearness, and is a faithful picture of the historic locality it represents.

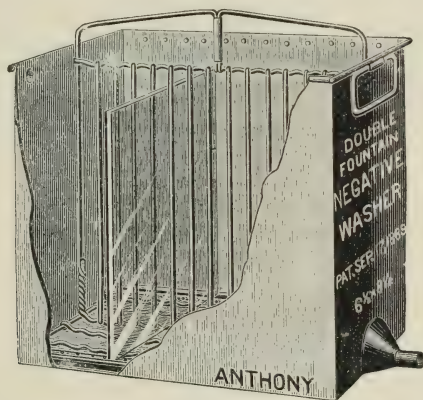
SOME NEW APPARATUS.

ONE of the most practical pieces of apparatus brought to our notice recently is the new amateur burnisher made by Entrekin. This is a moderate priced instrument suited to the needs of workers on prints not over 8 inches wide. It is made in several styles, with all the care and finish bestowed upon the larger machines. It is not cheaply constructed because moderate in price, but is a thoroughly good piece of mechanism finely finished. We give below a cut of one style of this new instrument for the amateur.



ENTREKIN'S NEW VICTOR BURNISHER.

Another very desirable piece of apparatus is the Moody Fountain Negative Washer.

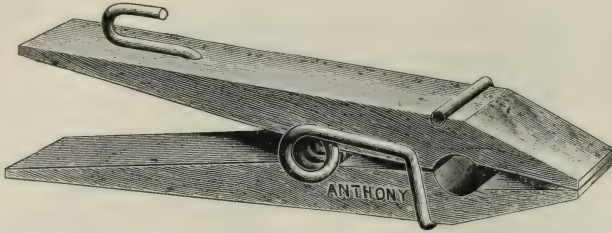


This is a new and thoroughly practicable arrangement for washing negatives, and consists of an outer box of heavy metal, provided with a tube at bottom for attachment of rubber hose, which distributes the water through perforated pipes running lengthwise of the box, the perforations of which are on the inside of pipe, and at such an angle to each other as to cause the streams of water to cross each other in an upward direction in the middle of the box, which results in a constant upward current to the overflow pipe, thus insuring a perfect elimination of free chemical agents from the negatives.

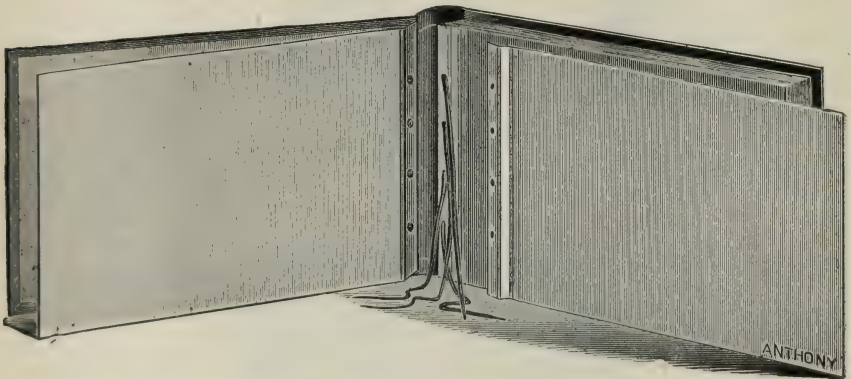
A movable wire rack, as shown in the cut, serves to hold fifteen negatives in an upright position within the box.

These negative washers are made in three sizes (5×8 , $6\frac{1}{2} \times 8\frac{1}{2}$, 8×10) only, but may be used for any size of plate smaller than the one named, without adjustment.

For those who sensitize paper, there is nothing so useful as the wooden clips to hold the sheets while drying. Quite recently some improvements have been made in their manufacture, and the U. S. Photo Clip is the latest of these inventions. It is remarkably cheap, and is thoroughly good at the same time. As the cut shows it is made of wood, with heavy wire springs, and is provided with a hook.



In the way of albums, the latest is the new Climax removable leaf album.



Each leaf of this album is independent of the book itself and its neighbor, and one or all may be removed from the covers, and the whole or part replaced by new leaves, with perfect ease. The covers and heavy fly leaves constitute the binding, the latter being very strongly made with linen guards, which are provided with four holes and lacings; the cards are provided with a jointed linen guard which is punctured to match lace holes in the fly leaves, and the whole operation of lacing one or more leaves is simplicity itself.

Prints may be mounted on either or both sides of card, and may also be burnished without injury to the album.

The construction of the double guard is such that there is no metal by which the burnisher can be injured.

Ease of binding makes possible a classification and rearrangement of subjects from time to time.

I THINK your BULLETIN the best thing published in photographic journalism, and I always look forward to its arrival with a great deal of pleasure.

J. A. PALMER,
North Carolina.

OBITUARY.

DR. OTTO JUST.

On the 5th of January passed quietly away in Zittau, Saxony, only fifty-four years old, Dr. Med. Otto Just. Although comparatively only recently (since 1885) a devotee to the photographic art, he has now a good name among amateurs, and embraced this beautiful science with such a zeal as only few will do. The many striking landscapes and views he took (among others those of the Wartburg in Thuringia, where Dr. Martin Luther translated the Bible) are the best and remaining testimony for him.

He will be missed by a great many of his amateur friends and admirers.

DR. EMIL HORNIG.

On the 6th of January died in Vienna, in the sixty-second year of his age, Dr. Phil. Emil Hornig, one of the most prominent promoters and indefatigable workers for the progress of photography. An excellent scientist, particularly in the different branches of chemistry, of unimpeachable character and highly esteemed by his friends, he was for many years (from 1871 to 1885) the presiding officer of the Vienna Photographic Society, and at the same time the managing editor and ruling spirit of the *Photographische Correspondenz*, one of the most ably conducted photographic journals in Europe and personally owned by him.

Sickness, which befel him some four years ago, prevented a continuation of his arduous duties as president of the society and editor of his much beloved journal, and compelled him to retire, although he remained a comparatively active member of the society almost to the time of his death.

His photographic labors have secured him an honorable place in the history of that science, and his excellent qualities will not soon be forgotten by his many friends in Vienna and abroad.

May he rest in peace !

MAJOR MOULTHROP.

WE regret to have to record the death of Mr. Major Moulthrop, one of the oldest of America's photographic artists. He died at his residence in New Haven, Conn., on February 27th, from a fracture of the right thigh, due to a fall on February 16th, and which, from his advanced age, the surgeons were unable to reduce. He was eighty-five years of age. Mr. Moulthrop was born in New Haven, and in his early days gained a reputation as a landscape and portrait painter. He also lived in Providence, New York and Brooklyn at various times, and afterwards returned to New Haven. About 1840 he learned the Daguerreotype process, and afterwards the wet plate process. In 1884 he retired. A son and two daughters survive him. He was widely known among photographers, and leaves an honored name after a long life of great usefulness.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting was held Wednesday evening, February 5, 1890, with the *President*, Mr. FREDERIC GRAFF, in the chair.

Communications were received from Messrs. E. & H. T. Anthony & Co., presenting a bound volume of Anthony's BULLETIN for 1889; from Edward L. Wilson, presenting a copy of "Photographic Mosaics" for 1890, and from Louis Reichner, Jr., presenting a gavel stone for use by the society. A vote of thanks was tendered in each case.

The Secretary announced that an International Photographic Exhibition would be held at Newcastle-on-Tyne, England, from April 23d to May 3d, by the Newcastle and Northern Counties Photographic Association. As this association had been particularly well represented at the various exhibitions in which the Photographic Society of Philadelphia was interested, he expressed the hope that members would show their appreciation of this fact by sending a goodly number of fine exhibits.

The Committee on Lantern Slides reported that the Interchange lantern slides shown at the conversational meeting were those of the Cincinnati Camera Club, and in addition, slides were shown by Dr. Mitchell, Dr. Reed, and other members. The committee, in accordance with the directions contained in a resolution adopted at the last meeting, had made preliminary arrangements for a public lantern exhibition at Association Hall, Wednesday evening, March 12th.

The Committee on Membership reported the election to active membership of Messrs. William C. Stevenson, Jr. and Joseph C. Roop.

A paper was read by Dr. Charles L. Mitchell, on "The Silver Printing Bath." (See page 139.)

Mr. Browne said that in listening to the very interesting paper, his mind reverted to many years ago when he had a good deal of trouble with the discoloration of the silver bath, and he mentioned one point that occurred to him. He had found after many trials a process of preparing the silver bath which obviated all difficulty from discoloration. He had been using it since 1863, and it was yet as clear as crystal. It was made originally of seventy grains of nitrate of silver to each ounce of water. To every quart of silver solution, a half ounce of concentrated ammonia was added, which, of course, made a precipitate that was cleared up with solution of nitrate of ammonia; then an ounce of alcohol was added to a quart of silver solution. It seemed odd to put in so much organic matter as an ounce of alcohol, but the bath never discolored.

Dr. Mitchell referred to a process he had tried in treating a bath that had become discolored, and in which he used a solution of caustic potassium. Warmth had caused an explosion.

Dr. Wallace, as an old pupil of Mr. Browne, said he had worked on the same idea as Mr. Browne described, making a slight departure. He had used sixty grains, afterward reduced to fifty, increasing the alcohol to 10 per cent. of the total bulk, and making an addition of alum as recommended by Mr. Anthony, of New York. It had never discolored unless exposed to light immediately after paper had been floated upon it. The solution was always in order.

In reply to a question of Dr. Mitchell as to the evaporation of the alcohol, Mr. Wallace said that when the bulk became reduced, alcohol was added.

Mr. McCollin exhibited a little instrument called Decoudun's photometer, or to coin a name, an "exposometer." He described it

as an apparatus for ascertaining the amount of exposure necessary in any subject. Through an oblong opening would be seen four holes—one larger and three smaller. After the picture had been focused on the ground glass the instrument was placed against the latter, turning the button at the back, looking through the oblong hole and watching the three smaller holes as the light disappeared. Then taking the instrument away and reversing, and looking through another round hole a letter would be found. This letter corresponded to a table which would give the time of exposure necessary on that particular view or subject.

(To be continued.)

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

CLINTON HALL, 19 Astor Place.
INFORMAL MEETING.

THE *Vice-President*, J. B. GARDNER, opened the meeting by announcing that the chief business of the evening was the selection of lantern slides of views in and about New York City, to be exhibited before the Section at its regular meeting, March 4th. Also to examine an optical lantern (manufactured by J. B. Colt) which could be used either with a lime light or with the ordinary kerosene oil.

The contribution of slides (more than a hundred in all) promised for the above-named meeting, was from the following gentlemen: A. L. Simpson, Charles Simpson, T. C. Roche, J. R. Riker, J. B. Colt, H. J. Newton, and A. D. Fisk.

The audience was composed mostly of experts in some one of the numerous branches of photography, especially that branch employed in the making of slides and the construction of optical lanterns.

Nearly two hours were taken up in the testing of slides with Mr. Colt's lantern—the first hour in demonstrating the intensity of light that could be generated with ordinary kerosene oil in connection with a mechanical contrivance devised by Mr. Colt, and in some respects differing from all other lanterns in the market. The second hour was occupied in contrasting the oil with the lime light, and though it was plainly shown that the latter was better adapted for large halls and very intense positives, it was also proven that the oil light was admirably adapted for parlor exhibitions and class-room lectures; also for slides whose excellence consisted in their delicacy of light and shadow—or in other words, not such cast-iron slides as can only be penetrated by the most intense sunlight, and are prone to represent a summer landscape only in her winter garb.

As regards the various criticisms and comments on the slides shown, it would be out of place to repeat here, as they were mostly apropos to only those present. That the meeting was a very profitable one to all interested in the making of slides and the best modes of exhibiting them, was expressed by marked attention and in the hearty thanks tendered to Mr. J. B. Colt for his service rendered in aiding to accomplish the special object for which the meeting was called.

The usual hour for closing having now arrived, the chairman declared the Section adjourned.

LYNN CAMERA CLUB.

THE rooms of the Club were well filled Tuesday evening, February 18th, with members and friends, gathered to witness the exhibition of the second set of the New England Lantern Slide Exchange. There were shown fifty slides from the Providence, R. I., Club, and sixty five from the Club of New Britain, Conn. Among those of the Providence Club attracting the most attention were "Rhode Island Hospital," "On the Pawtucket River," and "Early Spring," by E. I. Glidding; "Evening," "The Ivy Elm," "View at Barrington, R. I.," this last being four views taken on one negative, by J. E. Davison; two views on Westfield River, "Mt. Desert, Me.," "Camp at Buck's Harbor," "Path through the Woods," "Hadley's Camp," by R. Clinton Fuller. A. A. Eddy contributed a most excellent and amusing slide, showing two girls in bathing costume, mounted on an old horse, standing in the water, entitled "Looking for McGinty."

From the New Britain Club, the most noteworthy were, "An Old Cypress," "Great Pyramid," "Interior Cathedral," two flashlights, "Fear and Joy," "Falls, north of New Britain," "Componce," a pleasure resort west of New Britain; bowlder at Componce, elephants in Central Park, this being particularly fine; bridge at Farmington River, view on Still River. The exhibition closed with a view entitled "Ewe and Lamb."

The next series will probably come from the Waterbury Club. The following are the clubs comprising the New England Lantern Slide Exchange: Providence, Boston, Lynn, Lowell, Worcester, Springfield, Waterbury, New Britain and Hartford.

At a special meeting of the Lynn Camera Club, held Tuesday evening, February 18th, the following names were added to the list of members: Messrs. J. H. Hollis, C. H. New-

hall, C. A. Coffin, B. Dore, B. F. Spinney, B. D. Bartlett, Dr. W. C. Cummings, D. J. Lord, H. A. Pevear, W. L. French, C. B. Tebbetts, L. S. Johnson, A. N. Johnson, C. W. Royce, A. E. Gloyd, L. P. Bartlett, Jr., and E. W. Rice, Jr. It was voted to hold a competitive exhibition of entirely amateur work by members of the Club in April. Negatives used in this exhibition must be such as have never been shown in public before. It was voted to limit the number of active and social members to one hundred, and, as the limit is nearly reached, those wishing to join should make application at once.

BOSTON CAMERA CLUB.

A LANTERN slide exhibition was given at the rooms of the Boston Camera Club, on Monday evening, February 10th, consisting of two sets of the New England Lantern Slide Interchange.

The first set shown was contributed by the Photographic Society of Waterbury, Conn., and fairly illustrated Waterbury, and also included quite a number of views in that vicinity, on the Naugatuck and Saranac Rivers and on the Sound.

This set taken as a whole was equal to the average technically, and there were a few which we think deserve special mention for their artistic as well as technical qualities, but a large number were not remarkable for either.

Those which we thought the best were "Naugatuck Valley," "Old Mill," "Evening on the Naugatuck," "At Greystone," "A Letter from the Boy," "Sunset at Twin Lakes," "Thorp's Lane," and "Who's Afraid of You?" and the others which also deserve mention were "Trinity P. E. Church," "The Hospital," "Hurdle Race," "Saranac River," "At the Well," "Pasture Land," and "Genesta."

The second set was from New Britain, Conn., containing a number of views taken in Mexico, which were accompanied by a rather interesting descriptive text, and also views in and about New Britain.

With this set came an apology for the quality of the slides, stating that this was their first attempt at slide making, which we should have thought if we had not been told, as most of them were quite inferior artistically and technically, and had a general effect of chalkiness and harshness which was unpleasant. But there were a few very good ones among them, of which we think the "Former Residence of Cortez," "Canal with Bridge,"

"View on Main Street Showing Park," and the "Yacht Sparkle," were much the best.

There were also one or two which were taken with a vest camera, and considering that fact, they were very good.

We shall hope to see a decided improvement in the future work of the New Britain Club, and taking into consideration the fact that this was their first attempt, the set as a whole was not nearly as bad as it might have been.

The exhibition was witnessed by the average number of the members of the Boston Camera Club and their friends, and altogether was quite enjoyable.

*Publication Committee of the
Boston Camera Club.*

THE PHOTOGRAPHIC SOCIETY OF JAPAN.

A MEETING of this society was held on Thursday, January 23d, at the rooms of the Geographical Society, Tokio, Mr. H. Holms in the chair.

Mr. Igarashi Norikadzu was unanimously elected a member of the Society, and a number of gentlemen were duly proposed and seconded as members of the society. They will be ballotted for at the next meeting.

Mr. Kajima Sebi showed a number of silver prints of different tints on silk of various light shades. Among other specimens were several Japanese *obi* with photographic prints produced directly on them. Silk appears to form a very effective support for photographic pictures. The prints were all done by the process already described in the *Shashin Shimpō*.

Mr. Asanuma showed and Mr. Ogawa explained the action of the "Kodak," the now very popular American hand camera, of which it is advertised "you pull a string, and we do everything else."

After this there was a lantern exhibition. A duplex lime-light lantern had been kindly lent by Mr. Nakashima Matsuchi, who worked it during the evening. He brought a large collection of excellent slides, and others were lent by the Rev. C. T. Cocking, and by Messrs. Fenollosa, Ogawa, West, Burton and Yai. Among others was a series to illustrate the frightful distortion that might be produced by the abuse of the "wide angle lens," an instrument that is useful enough within certain limits. One photograph represented an enormous pair of feet, or rather boots, with a long perspective of legs and a very small head and body apparently in the "middle distance behind them;" another showed a jinrikisha and fare, the jin-

rikisha man a giant filling up half the picture, his fare apparently far in the distance, the shafts preternaturally long; and another of a man holding out a glass of beer at arms length; the glass exaggerated to about the size of the man. It is the introduction of this distortion, to a degree less than described, but yet quite evident to a trained eye, by the ignorant use of wide-angle lenses that has induced some artists to state that a photograph is never in "correct drawing," a statement that a very elementary knowledge of optics shows to be entirely wrong.

In spite of the abominable weather that seems to be the fate of the Society, there was a large attendance, and a thorough appreciation of the exhibition was shown.

The meeting ended by a vote of thanks to the lender of the lantern, and to those who had brought slides.

LOWELL CAMERA CLUB.

THE Lowell Camera Club has been busy this winter, devoting a good deal of time to lantern-slide making, a subject new to most of the members. The President, Mr. William P. Atwood, a practical chemist and enthusiastic amateur photographer, has done much to bring about this interest in slide-making. He has experimented with the new developers, and tested the "best" formulas as they have come out, and reported his results to the Club. Others have followed his lead, and considerable success has been attained. It is necessary to make slides to fully appreciate them. A good slide affords no little pleasure and satisfaction to the maker as it is brought out upon the screen.

Five of the nine sets of slides in the New England Lantern Slide Exchange have been exhibited before the Club. The Providence and New Britain sets were shown at the meeting held February 25th, and were much enjoyed by the members and friends. Many of these slides are of excellent quality.

Letters from each of these clubs, explaining their methods of work, were read. They were very interesting and instructive, and furnished some good ideas. The New Britain Club recommended varnishing the slides with collodion varnish. From tests made it is found to work well. It seems to give a greater brilliancy to the picture.

The Club is at work on a set of slides illustrating the City of Lowell.

GEORGE A. NELSON,

Secretary.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—T. M. W. sends a couple of cabinets with yellow stains around the vignetting, and writes: I had a good deal of trouble with stains like these for some weeks past. Some of the stains are worse than these, but many are as bad as the ones sent. What is the cause? We appear to wash well and I cannot understand it. Please answer in the next BULLETIN and oblige one who values the journal very much.

A.—Your trouble is evidently due to imperfect fixing. Your fixing bath may be too weak, or what is more probable, too cold. In cold weather it takes considerably longer to fix prints than when the temperature is 60 or 70 degrees. Be careful to use good clean hypo solution, and keep the temperature constant, say 60 degrees Fahr. Also remember that there is a limit to the number of prints you can fix in a given bath. With prints the bath should never become slow in action if reasonably strong; slow baths are becoming saturated and fix imperfectly.

Q.—C. F. K. sends piece of albumen paper with minute black spots on it, and writes: Please answer through the columns of your valuable BULLETIN the cause of those black specks on paper inclosed. I do not silver near my dark room and I keep my paper between blotting paper in a dust-proof box, also I excite it before silvering with a piece of flannel. Float in a 60-grain bath, and fume three quarters to one hour in a large fuming box. I do not notice spots until after fuming. Also how can I apply soap bark to pictures before spotting in India ink, so the spots will not rub off? I have made it one tablespoonful to a pint of water and thicker, also thinner, but it seems to do no good. Can I apply anything else?

A.—Examined with a microscope, the black spots are upon the surface of the albumen, and are probably due to minute particles of metallic dust floating in the air. Of course it is impossible for us to say just what metal they are; but possibly they come from some machine shop or factory located near you. See if this is not probable, by inquiring about location of factories in your neighborhood, and

also note the direction of the wind when the spots appear. We have seen a similar case due to this cause. In regard to the question of spotting, use gelatine water, 5 grains to the ounce, and rub down the India ink with; dry thoroughly before burnishing.

Q.—F. M. writes: Have you published in the BULLETIN any articles on photo-etching? If so, please give dates or numbers that I may get them.

A.—We have published one upon this subject July, 1884, and in the "International Annual" for 1888, we published an excellent and very exhaustive article by the late Dr. Maurice N. Miller. See page 377 of "Annual."

Q.—W. A. A. writes: We have been using eikonogen, but could not get the required density with it that pyro gives. Will you be kind enough to tell me if there is any formula we can use to increase density?

A.—Use the formula given by Dr. Vogel in BULLETIN, page 423, July 27, 1889. Do not mix the alkaline carbonate with the eikonogen and sulphite, but keep in separate solution.

Q.—H. L. writes: Please tell me if you know of a work that treats on photography on china or the burning-in process? Or do you know the formula for the toning of colodion films made by the cadmium salts with chloride of iridium, or the burning-in process? I have made these pictures, but cannot make them permanent when they are fired.

A.—We do not know of a book in the English language upon this process. There are French works by Geymet upon this subject that are very good and practical: "Traité Pratique des Emaux Photographiques;" "Traité Pratique de Céramique Photographiques;" "Traité Pratique de Platinotypie sur Email;" "Héliographie Vitrifiable"—all published by Gauthier-Villars et fils, Quai des Grands Augustins, Paris.

Views Caught with the Drop Shutter.

BARTHOLOMEW & PECKHAM, 18 Spruce street, New York, send us a handsome album of their photo-chemical engravings. The work exhibited is certainly some of the best of its kind. It is really marvellous to note the perfection of photo-mechanical printing as exhibited in this beautiful series of pictures made from photographs, wash drawings, pen and ink sketches, and direct from objects.

THE ACME BURNISHER COMPANY send us a photograph of their new water-power factory at Fulton, N. Y., the main building of which is 220 x 50 feet. It is certainly a very extensive establishment and we wish the company every success. The special manufactures to be made at this new factory are the Acme Rotary and Stationary Burnishers, Print Trimmers, Odorless Lamp Stoves, Atmospheric Gas Heaters, and Portable Racks for Oil Stoves.

W. P. MAYNARD, the well-known photographer of White Plains, N. Y., has been appointed postmaster of that town.

W. H. WALMSLEY, Limited, of 1022 Walnut street, Philadelphia, sends us two handsome flash-light pictures of the interior of their store. These were made with Hemperley's magazine flash-lamp, and are remarkably good. We have also received a very full catalogue of photo-micrographs and lantern slides of same from negatives made by Mr. W. H. Walmsley. We can strongly recommend these to all who require such pictures, either prints or slides, as they are beautifully executed, and the variety is very large, illustrating the animal, vegetable and mineral kingdoms.

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Empire Photo Engraving Co. N. Y.

— K. OGAWA —

EDITOR OF THE SHASHIN SHIMPO
The Japanese Photographic Journal

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor*.
ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor*.

MARCH 22, 1890.

Vol. XXI.—No. 6.

THE WASHINGTON CONVENTION OF THE PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

THE Executive Committee of the Photographers' Association of America have decided to hold the next Convention at the Smithsonian Institution, in Washington, from August 12th to 16th next. We are assured that every effort will be made to make the meeting a success, and if we may judge from the energy and interest displayed by the new officers during the Convention in Boston last year, we are sure that it will be from no lack of enthusiasm on their part if the meeting at Washington does not prove all that its best friends wish it to be.

As usual there will be a grand prize for a set of three composition pictures illustrating Tennyson's "Enoch Arden." This prize will be a bronze, entitled "Nearing the Goal," and worth \$225; and the pictures competing must be not less than thirteen, nor more than 22 inches in length.

The poem given as a *motif* for the pictures is full of the most picturesque scenes, illustrating the life of the sailor, Enoch Arden. The opening lines of the poet describing the children, Annie, Phillip and Enoch, are full of beauty in thought and situation. The marriage of Enoch and Annie is another opportunity to infuse into the pictures some very attractive pieces of photographic composition. Another extremely fine situation is Enoch contemplating the sale of his boat to set Annie up in trade before he leaves her for a long voyage. The children of Enoch playing with Phillip, the miller, after Enoch's long absence, is also another pretty scene. The shipwreck of Enoch and his companions on the lonely isle, with its tropical vegetation, would afford another fine theme for composition. What beauty there is in a scene like the following!

"The slender coco's drooping crown of plumes,
The lightning flash of insect and of bird,
The luster of the long convolvulus
That coiled around the stately stems;"

and with the solitary figure of a shipwrecked sailor looking out through the vista at

"The scarlet shafts of sunrise—but no sail,"

would make a picture of uncommon beauty if rightly treated.

But we need not enumerate the many opportunities for fine composition

offered to the photographer in this charming poem. We hope to see many fine pictures at Washington competing for the grand prize.

In Class A, genre pictures, a change in the award has been made from a medal to a silver plaque mounted in plush. This will make a handsome prize, and six genre pictures, not less than thirteen nor more than 22 inches long, must be sent for competition.

Besides the above prizes, there are to be three gold medals for American exhibits in the other classes, and one gold medal for foreign portraits. There will also be seven silver medals and six bronze medals. It will, therefore, be seen that the chances of obtaining a medal for good work are certainly favorable to competitors.

The foreign exhibits must be sent direct to the Secretary of the Photographers' Association of America, at the Smithsonian Institution, Washington, D. C., free from all charges. If this rule is followed, they will be admitted to the United States duty free.

We would also call special attention to the regulation that all entries close on July 15th, and no space will be allotted to exhibits after that date. For several years exhibits have arrived so late, even after the opening of the Convention, that the officers have found it impossible to place them in position, and they have remained unhung much to the disgust of the senders. We hope that the officers will adhere rigidly to this new rule in regard to time of entry, and that all intending exhibitors will make good note of it. After the opening of the Convention, the officers should be in attendance at the meetings, not doing work that may all be completed before August 12th.

Another rule that should be strictly adhered to is, that all exhibits must be made from negatives taken since the last Convention held at Boston, August, 1889.

The officers promise us to have some interesting material for the meetings in the shape of papers, and talks leading to discussion upon topics of interest to all photographers. If this programme can be well carried out, there is no doubt that the next Convention will be a profitable one to all present, and we hope to have the pleasure of seeing many of our readers at the BULLETIN headquarters in Washington, August, 1890.

EDITORIAL NOTES.

A new formula for developing transparencies and lantern slides was recently communicated to the Photographic Association of London, by Mr. A. Cowan. It is made as follows:

Rochelle salt	25 parts.
Sodium sulphite	25 "
Lithium carbonate	1 "
Pyrogallol.....	2 "
Water.....	450 "

According to Mr. Cowan this is the most powerful developer that he knows, and the solution remains clear during the development of many plates.

The following method of making ferric oxalate, used by Weisenberger, and published in the *Photographische Mittheilungen*, is neat and worthy of a trial by

those experimenting with platinum printing. He dissolves forty parts of anhydrous ferric sulphate in four hundred parts of hot water, and adds eighty-six parts of pure crystallized sodium carbonate dissolved in two hundred parts of hot water. The precipitate formed is washed with cold water until it is perfectly neutral to test-paper. By now adding forty-nine parts of pure oxalic acid in powder, the precipitate dissolves completely, and on adding water to make one hundred and eighty-seven parts, the solution will contain 20 per cent. of ferric oxalate and 6 per cent. of free oxalic acid, and may thus be used in the platinum process.

NEW organic bodies to be used in photography are still the order of the day. Here are two of them : Oxymethyl-sulphonate of silver and oxymethyl-sulphonate of hydroxylamine. The first is added to the silver bromide emulsion in the proportion of 1 or 2 per cent. of the haloid silver salt, and is said to give great sensitiveness ; the second is used as a developer in alkaline solution.

THE Society of Amateur Photographers of New York are about to move into new and more commodious quarters at 12 West 31st street, where they will occupy two floors. These will be fitted up with every improvement, including electricity.

THE applications of photography are becoming very varied. In a law suit in Germany, Dr. J. M. Eder was called upon to see if he could determine the writing upon a document which had been rendered illegible from ink spilled over it. By using an erythrosine plate properly exposed by gaslight, and developed with pyro and soda, he was able to show the hidden characters beneath the blot that covered them.

STAUFFER, the photographer, at Asbury Park, N. J., sends us an excellent interior, which he says he made last summer. It is certainly very finely done, and speaks well both for the lens and the man that used it. It is clear and sharp to the edges on an 11 x 14 print; the light is nicely managed, and makes an uncommonly handsome interior. The lens was an 8 x 10 wide angle.

Frank Leslie's Illustrated Newspaper offers a prize of a two hundred dollar camera to the amateur photographer who will send the best and most artistic photograph to it. The pictures competing are to be used as illustrations for the paper, and Mr. Pach, the well-known New York photographer, and one of the artists of Frank Leslie's are to be the judges. Only amateurs can compete.

THE "International Annual" is well under way for issue on June 1st next. There will be the usual number of valuable articles contributed by the leading photographic lights of the world, together with about twenty illustrations, giving examples of the finest work in photo-mechanical and other printing processes. These illustrations we are told will surpass anything hitherto attempted in this line of work, and with the well-known character of the literary and scientific part of the "Annual," will make it a volume much to be desired by every progressive photographer. Those who need the volumes for 1888 and 1889 should secure them at once, for the stock of the publishers is nearly exhausted, and these books will be more and more valuable as time passes.

WE are indebted to the Lynn Camera Club for a very neat copy of their Constitution and By-Laws. They are clear and to the point, and might well serve as examples to some of our more ambitious organizations.

SOME time ago we called attention to the fact that an attempt would be made to photograph the bottom of an oil well. This has recently been accomplished at Warren, Pennsylvania, at a depth of 1,700 feet. It was a flash picture, taken at the moment the apparatus touched the bottom of the well. The negative showed a cavity 14 feet broad, with rocks and sand, the result of a torpedo explosion.

THE Hoboken, N. J., Camera Club held a meeting on March 4th, at which the following officers were elected: *President*, A. J. Thomas; *Vice-President*, F. A. Muench; *Secretary*, George Steljes; *Treasurer*, Charles L. A. Beckers; *Custodian*, A. C. Ruprecht; *Trustees*, A. Beyer (three years), G. E. Mott (two years), E. Gritten (one year); *Committee on Instruction*, W. Allen, W. Sachs, F. Schneider; *Press Committee*, George E. Mott, Paul Muller. Their quarters now embrace the entire upper floor of 140 Washington street.

THE New York Camera Club will have a private exhibition of prints made by members, beginning April 14th next, at 314 Fifth avenue, and to continue one week. Members are requested to furnish prints.

THE Peekskill Camera Club had an exhibition of the work of members from March 17th to 22d, at Coolies Hall on Division street. A large number of prints were entered for competition for diplomas, and when we consider the size and age of the club the result was very commendable. From much less than half a hundred members there were as many pictures on exhibition as we remember to have seen at the first exhibition of the Society of Amateur Photographers of New York when it had three times as many on its rolls as this young but enthusiastic little band of workers up the Hudson River. The pictures were well exhibited in a large room well lighted by electricity, and in addition to the competing prints there were a large number of other frames containing some very handsome work by members of the club. Mr. Frank Anderson, the artist, and the associate editor of the BULLETIN, were the judges selected to award the diplomas. The following are the names of those receiving awards: For landscapes, Mr. F. H. Southard; for portraits, Mrs. P. H. Mason; for interiors, Miss Emily L. Robertson; for flash-light pictures, Mrs. P. H. Mason; for snap-shots, Mr. Ashbury S. Barker; for out-door groups, Mr. Henry B. Miller. Quite a number of other pictures received honorable mention by the judges, those selected for the awards being the best three pictures in the collections of the exhibitors and in the classes named. With so much good working material in the club we hope to see a set of lantern slides illustrating picturesque Peekskill before another winter comes to us. Nature has been lavish in the beauty with which she has endowed the Highlands of the Hudson, the home of the Peekskill Club.

ENGLISH NOTES.

ONCE again the "photographic season" is approaching. An unusually mild winter promises to be succeeded by a "bright and early spring;" and out-of-door workers are already beginning to put their traps in order. The camera should be carefully examined for cracks and pin-holes; dark-slides ditto. All parts of our tools which are required to move upon one another should have a drop or two of watchmaker's oil applied to them. This precaution is especially necessary in the case of shutters; unless these are carefully cleaned and oiled after their long rest, they will work—if at all—at much less than their original speed.

It is a good plan to keep a catalogue of one's apparatus as well as one's library. In this catalogue the name, date of purchase, cost, name of maker, etc., should be entered; and a good space left for "remarks." Such a list will be found to serve many useful purposes as time passes. Few workers have any idea, for instance, of their average annual expenditure on photography, and such a catalogue will give the required information. Many articles are lost sight of—they are mislaid, lent or lost—they pass from our memory, and we forget that we ever had them. By looking through our record in "black and white," we shall remember to call for that wide angle lens which we lent to either Jones or Brown a twelvemonth ago, and to remind Robinson of the fact that he borrowed our second-best shutter "for a day," and has had it two years!

Not less important is a general register of negatives. The exposure-book, which is carried in the field by every photographer, and in which he enters particulars of subject, date, lens, time of exposure, etc., is a small pocket volume, which soon gets filled up, and is then very liable to be lost. The particulars contained in it should be copied into a sort of ledger, a large stout volume, which should also contain additional columns for such particulars as "time of exposure for bromide paper at 2 feet from gas-burners," "time for making lantern plates by contact," etc. Every negative must have its progressive number, which is best written on one corner of the glass with a writing diamond, and which is then copied into the ledger. A great saving of time and of materials may be accomplished by such registers as these. Of course such clerical tasks are despised by the slap-dash worker, who is always in a hurry; but perhaps less sultry language would be heard in his dark room if he could be persuaded to adopt such a system.

The "boom" of the coming season will be the general adoption of hand-cameras, to be carried instead of, or in addition to, one's ordinary kit. While I develop my own work I prefer to use glass plates instead of films or paper in these small cameras. Not only is the change of plate effected more rapidly, but the convenience of being able to develop any given or single exposure is very great, and there is no loss of material, as must be the case when a roll of films, etc., is exposed, bit by bit, and developed one or two exposures at a time.

Ortho-chromatic photography deserves to have much more attention paid to it by the average photographer than is at present the case. Let every one ortho-chromatize a few sample plates in the following manner, and I believe they will be pleased with the results, especially if they will test the plates upon flowers, fruits, paintings, etc.

Buy a dozen of the slowest plates you can get—transparency plates are best. Then make up the following solutions :

I.—Ammonia.....	1 dram.
Distilled water.....	12½ ounces.

This is a 1 per cent. solution.

II.—Erythrosin.....	7 grains.
Ammonia.....	1 dram.
Distilled water.....	16 ounces.

The erythrosin should be pure ; the ordinary article sold as an “eosin dye” may or may not answer well.

Wrap two or three thicknesses of brown tissue paper round your dark-room lantern, and then immerse each plate in turn for two minutes in solution I ; then drain and transfer immediately to solution II, in which each plate may be allowed also to remain two minutes. Wipe the backs of the “dipped” or “bathed” plates, and stand them on strips of blotting-paper in a warm place till dry, which will not take long. Such bathed plates are far more sensitive to yellow and green light than ordinary plates. The dishes should be covered as much as possible while the plates are being bathed in them, and they should be screened from light of every kind. Unfortunately, these ortho-chromatic bathed plates do not keep well ; so it is not wise to prepare a large number at one time ; but if used within two or three weeks they will be found all right. They should be given a full exposure, and during the early stages of development (any developer may be used, but it is better to avoid ammonia) the dark room lamp should be covered with brown tissue paper.

I note that a second edition of Dr. P. H. Emerson’s striking book on “Naturalistic Photography” has lately been issued ; and the same writer has also published a new work, “English Idylls,” in which are many beautiful passages of descriptive writing ; the scenes of the short stories of which the book consists being the author’s favorite district of the eastern counties of England.

The muster-roll of the London Camera Club is now getting on towards six hundred members, and their present premises in Bedford street are wholly inadequate to their requirements. Arrangements are being concluded for the lease of a six-story building, to be erected in Charing Cross Road, which will be beyond all question a palatial and fitting home for what has become the first body of photographers in the world. When the new premises are opened we predict that the membership will, within the succeeding year, exceed one thousand.

The Eastman Company has now been fairly floated as a British company, distinct from that in the States. Seven acres of land have been acquired at Harrow, a few miles north of London, and here a large factory will be erected. Mr. W. H. Walker has won the respect and esteem of every English photographer who has come into contact with him ; and to his acumen and energy the success of the Eastman Company on this side of the water is mainly due.

A very interesting exhibition is just now open in the rooms of the Royal Geographical Society. It consists of some grand photographs of the Caucasus region, taken by Signor Sella and others during the recent search in that wild and mountainous region for the party (which included Mr. Donkin, Secretary to the Photographic Society of Great Britain) of British tourists who lost their lives there last autumn. Mr. Donkin’s bag was found, and some exposed plates which it contained have been developed ; but the bones of the ill-fated moun-

taineers doubtless lie in some inaccessible spot—buried perhaps beneath an avalanche.

The Meteorological Society is also about to hold an exhibition showing the special applications of photography to meteorology. Photographs of lightning-flashes, of clouds, of phases of the weather, etc., with sunshine recorders, barographs, etc., will doubtless be there.

The second week of March also sees the opening of the biggest “photo show” of the year—that held at the Crystal Palace on the heights of Sydenham. I am informed that the display of apparatus will not this year be so extensive as last (some of the manufacturers holding aloof); but that the display of pictures will be very large. A new feature, due to the suggestion made by Mr. Jerome Harrison, is the offering of a challenge cup for the best exhibit of not fewer than fifty pictures by any photographic society. The cup is to be held by the mayor of the town to which the society belongs, and there will be a brisk competition for it. If the same society wins it three years out of seven, it will become their absolute property.

Finally, that Phœbus Apollo may hold the reins steadily, and give us plenty of sunshine, so that 1890 may be a “bright year” in the memory of photographers, is the hearty desire of

TALBOT ARCHER.

THE AMYL ACETATE LAMP AND THE ORTHOCHROMATIC GELATINE PLATE.

BY V. SCHUMANN.*

For the discovery of the degrees of sensitiveness of the gelatine dry plate, none of the proposed measures of sensitiveness have had such a general and extensive circulation as Warnerke's sensitometer. Although not free from defects, which might even become critical as to the reliability of the results obtained, it must be admitted that for general practical use it offers sufficient security. The reason why it meets with so much favor may to a great extent be due to the facilities with which it has been endowed by its inventor.

It must be admitted that this small but very handy apparatus is a serviceable arrangement, although it should be borne in mind that its mechanical execution still lacks much that is desirable.

The advantages of the Warnerke sensitometer seem to have also been recognized by the Photographic Congress which met in Paris from the 6th to the 17th of August, 1889, they having accepted the sensitometer as a normal sensitive measure for photographic plates. But the light source, prescribed by Warnerke, has been dropped, the amyl acetate *lamp* of Heffner Alteneck offering greater advantages in that respect.

The amyl acetate flame is undoubtedly superior in constancy to the illuminating plate of the Warnerke sensitometer, if all the rules prescribed by its inventor are observed. But constancy alone does not serve photography. The quality of the radiating light is just as important. The largest number of photographic views being taken in diffused day or sunlight, these should deserve the preference to all light sources as normal light for sensitometric measurements. But unfortunately both are absolutely unsuitable for such a purpose on account of their inconstancy. The phosphorescent light of the Warnerke plate is also not

* From sheets of the *Photographischen Rundschau*, sent by the author.

constant, but its reduction of light takes place so regularly that the same illuminating strength can be counted upon each time, as long as the time intervals prescribed by Warnerke are kept up conscientiously.

But the phosphorescent light of the Warnerke plate has also one weak point: it is nearly monochromatic. Its spectrum consists of hardly more than one band, which shows moderate width and is in the light blue. Of red and yellow I could perceive nothing during former trials and the present one. The same observation was made by Dr. Eder.

It is now a favorable coincidence that the ordinary bromide of silver gelatine plate, and perhaps a little more those containing iodide, is highly sensitive for just the rays emitted by the phosphorescent plate. This proves how justified such authorities as Dr. Eder were at the time they raised their voices in favor of the Warnerke sensitometer. This took place years ago, at a time when the color sensitiveness of the orthochromatic plate had not reached the high rank of to-day. At present, when we possess the erythrosin silver plate, excelling in its yellow sensitiveness, the conditions are essentially different. If, for instance, an erythrosin silver plate is exposed in the Warnerke sensitometer, it is evident that the yellow sensitiveness will show no effect, the luminous plate emitting only blue light. In this case, therefore, the sensitizer does not come into action, and the consequence is that the developed plate will indicate a degree of sensitiveness too low. All sensibility measurements executed by means of the Warnerke luminous plate will therefore disclose only the blue sensitiveness of the tested plates. This defect need not be apprehended by application of the amyl acetate flame. It contains light of all wave lengths, from the extreme red to the deep ultra violet, only the energy of its rays is divided quite differently from that of sunlight. Yellow and red predominate here, while blue and violet have the supremacy in sunlight. This shows conclusively that the amyl acetate light cannot be considered as a normal light source. As my own experiments have taught me, the erythrosin silver plate, for instance, shows in comparison with the ordinary bromide of silver gelatine a much too high sensitiveness when both are exposed in the Warnerke sensitometer with the amyl acetate flame. Any one who would determine after this the time of exposure of both for day and sunlight could soon observe that the sensitizer acts relatively much more powerfully in lamplight than in sunlight.

A measure of sensitiveness is, strictly speaking, only of value for that light in which it was taken. Its relation to other light sources can only be discovered by particular tests, which are to be made separately for each, and even then only spectrographically. It is useless to determine by means of ocular observation the condition of the photographic energy of the light sources to be compared, each comparison of this kind having only a purely physiological value. The retina of the eye is excited in an entirely different degree by light of different colors than the photographic plate. This difference appears most strikingly in the ultra-violet, for which the eye is almost blind, but the plate is highly sensitive, and in spark spectra it is even still more sensitive than for the visible spectrum. The ordinary bromide of silver gelatine is reversed toward the rays physiologically most active; the yellow-green, yellow and red are as good as non-sensitive.

This shows that the amyl acetate light for sensitometry offers by no means a particular advantage, even apart from little defects in connection with its

application, as, for instance, the high sensitiveness of the flame toward draught caused by air.

For years I have worked with a Warnerke sensitometer, and apply as a light source its luminous plate, as well as the normal lamp of Heffner-Alteneck. But I must confess that I give the preference to the former, on account of its comfort.

If one, or only a few, plates are exposed, lamp light requires considerably more time than plate light. This is ready for use a minute after igniting the magnesium; the other requires some time before the flame has reached the normal height. The flame is also a disturbance during the filling of the holders, so that the lamp, if not securely covered, has to be removed from the dark room each time when plates are changed. The easy manipulation of the Warnerke sensitometer and its modest claim of space facilitate its use.

After all that I have experienced in the course of years in any sensitometric experiments, I cannot consider the introduction of amyl acetate lamp, as accepted by the Paris Congress, as progress. It seems to me as if the Congress, in its choice of a normal light, has been governed too much by the physiological effect of the lamp in question with little or no consideration as to the progress made by the orthochromatic plate during the last years.

[From the British Journal of Photography.]

ON CONTROL IN THE DENSITY OF NEGATIVES.

BY CHAPMAN JONES, F.I.C., F.C.S.

[A Communication to the Photographic Society of Great Britain.]

It is universally allowed that the practical density of the deposit obtained in a gelatino-bromide negative is difficult to estimate during development, probably on account of the variable printing value of negatives that have the same apparent densities, and certainly because of the opacity of the film. This last difficulty is increased when the sensitive salt is in suitable quantity to prevent light passing through the film so as to make the best possible gradation and avoid the evils of halation.

The photographer who aims at something higher than to simply take what comes on his plate and make the best of it in printing, has a choice of three principles of action in controlling the densities of his negatives. He may get as close as he can to the desirable condition by development, and trust to processes of reduction if his plate is too dense, and to intensification if it is not dense enough; or he may get density at all risks, and endeavor, if necessary, to reduce his negatives to what he wants; or, lastly, he may take care that the density got by development shall never be too great, so that the error may be corrected by intensification alone. Each method has its advocates, and is doubtless occasionally useful; but the amount of control obtained by the usual processes is so small, and the uncertainty of the various operations so great, that many expert workers prefer to either print from or else altogether reject their negatives as produced by simple development. It is the aim of the author to do away with this uncertainty, and to show how—what is for all practical purposes—a perfect control may be realized in the densities of negatives.

It has been shown by Captain Abney that in all probability the amount of

silver deposited in a film by development, after exposures within the ordinary limits, is proportional to the actinic power of the light acting upon the sensitive salt, though the opacity is not strictly proportional. It will be convenient to speak of the gradation in such negative as "normal." In methods for altering the densities of negatives it is important that the gradation shall remain normal, being either increased or diminished throughout the scale in a proportional manner. An alteration of the gradation may sometimes be good, but it will be allowed by all that a standard process working with exactness is desirable, if only as a point from which departures may be made.

In seeking for methods by which the control of density may be obtained without destroying the normal character of the gradation, it is necessary to remember the very appreciable thickness of the sensitive film, and that in almost every case the reagent employed begins to act at its outer surface. This demonstrates at once that to get with certainty a normal alteration of density, the changes produced must be such as may be allowed to work thoroughly and through the film. A thorough reduction by any of the usual processes would lead to a complete removal of the image, and methods of reduction are, therefore, useless for the normal control of density. It may, perhaps, be possible, by employing a very dilute reducing solution, to get the reagent to work so slowly that it penetrates the film before it appreciably acts, and so by beginning to produce its effect on the whole image at the same time to work normally; but there can be no guarantee that the action is not irregular. It may, perhaps, in a somewhat similar manner be possible to get a normal intensification by the use of a reagent that first intensifies and then reduces, but in practical work it is not possible to be sure that the reducing effect has not begun at the surface before the intensification has reached its maximum in the high lights that extend deep into the film. Such irregular processes may have their uses in which their characteristic irregularities are taken advantage of, but as standard methods of work, in which certainty is important, they can only be regarded as treacherous and unsuitable.

It remains, therefore, in getting control of density with certainty, and without producing abnormal results, to take care that the negative as developed is not too dense, and to seek for methods of intensification that shall give increase of density in easy stages, and are free from the faults above named. Taking into consideration also such matters as permanency of result, it appears that by the use of mercuric chloride, sodium sulphite, and ferrous oxalate, in the manner hereafter described, the control sought for may be realized.

It will be convenient to consider the subject under the following divisions:

HISTORICAL REFERENCES.

CHEMISTRY OF THE CHANGES.

Action of Mercuric Chloride.

Action of Sodium Sulphite.

Action of Ferrous Oxalate.

PRACTICAL METHODS.

HISTORICAL REFERENCES.—In a letter addressed to the editor of the *Photographic News* in 1878, Mr. J. W. Swan stated that "ferrous oxalate advantageously replaces the nitrate of silver, Schlippe's salts, or other of the chemicals now commonly used for blackening the image after treatment with bromide of copper." In 1881 Messrs. C. I. Burton and A. P. Laurie described, before the

Edinburgh Photographic Society (*Photographic News*, xxv, 269), some experiments with intensifiers. After bleaching with mercuric chloride, they sought to blacken the negative by exposure to light, and failed. They therefore used mercuric bromide in saturated solution instead of the chloride, washed the plate, exposed it to sunshine for about a minute at least (the longer the better), and then applied a developer. They preferred ferrous oxalate as developer, but stated that pyrogalllic acid was also serviceable. They found that the process might be repeated several times on the same negative. Scolik's method of intensification, by treatment with mercuric chloride or bromide, followed by sodium sulphite, was introduced in 1884 (*Photographische Correspondenz*, xxi, 265), and Dr. Eder, in the "Year-book of Photography" for 1885 (page 100), states that "the white and insoluble mercurous chloride which is deposited upon the plate is rapidly reduced to the metallic state by the sulphite." He says, in addition, that mercury forms a stable image.

(To be continued.)

[From the *British Journal of Photography*.]

THE DISTANCE BEYOND WHICH ALL OBJECTS WILL BE IN FOCUS WITH ANY GIVEN LENS.

BY SIR DAVID SALOMONS, BART.

[A Communication to the Photographic Society of Great Britain.]

THE author found a simple formula for ascertaining the distance beyond which all objects will be in focus with any given lens—it is $f + 100f^2R$ inches—where f and R have the same meanings as usual. This formula is very useful to ascertain the most suitable lenses for detective cameras and for other purposes. It is assumed that if points in the object are represented in the image by circles having diameters of $\frac{1}{100}$ inch and less the picture will be sharp.

A special instance will be given to show its use:— $100f^2R$ inches may be written $8\frac{1}{3}f^2R$ feet, since 100 inches = $8\frac{1}{3}$ feet. The addition of f in the formula may be neglected, being small compared with $100f^2R$. Most of the rapid landscape lenses work at $f/8$, so the formula reduces itself to f^2 feet approximately. This shows that with any lens $f/8$ all will be in focus after a distance expressed by the square of its focal length in feet. Putting the formula in words, $100f^2R$ inches reads:—100 multiplied by the ratio, multiplied by the square of the equivalent focal length of the lens, expresses in inches the distance beyond which all objects will appear in focus. To give an example:—After what distance will all objects be in focus with a lens stopped $f/12$ (i. e., $\frac{1}{12}$), the equivalent focus being 10 inches? Answer: $100 \times \frac{1}{12} \times 10 \times 10 = \frac{1000}{3} = 833\frac{1}{3}$ inches = 69 feet $5\frac{1}{3}$ inches. To be strictly accurate, add f (= 10) to this, and distance becomes 70 feet $3\frac{1}{3}$ inches from optical center of lens.

It is a good plan to mark the stops for the distance, after which all will be in focus, as well as the standard number. In practice this is valuable, for when a subject is to be taken requiring a particular stop to get the focus right, and it is found that this stop has a number requiring too long an exposure, a plate is saved.

The following table will be found useful for many purposes, some 1,200 calculations having been made to compile the results given :

FOCUS TABLE FOR DETECTIVE CAMERAS AND OTHER SPECIAL WORK.

Focus of lens in inches.	Ratio Marked on Stops.															Focus of lens in inches.
	f-7	f-8	f-9	f-10	f-11	f-12	f-13	f-14	f-15	f-16	f-17	f-18	f-19	f-20		
	Number of feet and inches after which all in focus.															
	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.		
4	19.4	17.0	15.1	13.8	12.5	11.5	10.7	9.10	9.2	8.8	8.2	7.8	7.4	7.0	4	
4½	21.10	19.2	17.0	15.4	14.0	12.10	11.10	11.1	10.4	9.9	9.2	8.8	8.3	7.10	4½	
4¾	24.5	21.5	19.1	17.3	15.8	14.5	13.3	12.5	11.7	10.11	10.3	9.9	9.3	8.9	4¾	
5	27.3	23.10	21.3	19.2	17.5	16.0	14.10	13.9	12.11	12.1	11.5	10.10	10.3	9.9	5	
5¼	30.2	26.5	23.6	21.3	19.4	17.9	16.5	15.3	14.3	13.5	12.8	11.11	11.4	10.10	5¼	
5½	33.3	29.1	25.11	23.4	21.3	19.6	18.1	16.10	15.9	14.9	13.11	13.2	12.6	11.11	5½	
5¾	36.5	31.11	28.5	25.8	23.4	21.5	19.10	18.5	17.3	16.2	15.3	14.5	13.8	13.0	5¾	
6	39.10	34.11	31.1	28.0	25.6	23.5	21.8	20.1	18.10	17.8	16.8	15.9	14.11	14.3	6	
6¼	43.4	38.0	33.10	30.6	27.9	25.6	23.6	21.11	20.6	19.3	18.1	17.2	16.3	15.6	6¼	
6½	47.0	41.2	36.8	33.0	30.1	27.7	25.6	23.9	22.2	20.10	19.8	18.7	17.7	16.9	6½	
6¾	50.10	44.6	39.7	35.9	32.6	29.10	27.7	25.8	24.0	22.6	21.3	20.1	19.0	18.1	6¾	
7	54.9	48.0	42.9	38.6	35.0	32.2	29.9	27.8	25.10	24.3	22.10	21.7	20.6	19.6	7	
	58.11	51.7	45.11	41.5	37.8	34.7	31.11	29.9	27.9	26.1	24.7	23.3	22.0	21.0		

Focus of lens in inches.	Decimal Standard Stop Numbers.								Focus of lens in inches.
	5	10	15	20	25	30	35	40	
	Number of feet and inches after which all in focus.								
	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	Feet. Inches.	
4	19.4	13.8	11.5	9.10	8.9	8.0	7.5	7.0	4
4½	21.10	15.4	12.10	11.1	9.10	9.0	8.4	7.10	4½
4¾	24.5	17.3	14.5	12.5	11.1	10.1	9.4	8.9	4¾
5	27.3	19.2	16.0	13.9	12.4	11.3	10.5	9.9	5
5¼	30.2	21.3	17.9	15.3	13.7	12.5	11.6	10.10	5¼
5½	33.3	23.4	19.6	16.10	15.0	13.9	12.8	11.11	5½
5¾	36.5	25.8	21.5	18.5	16.5	15.0	13.10	13.0	5¾
6	39.10	28.0	23.5	20.1	17.11	16.5	15.2	14.3	6
6¼	43.4	30.6	25.6	21.11	19.6	17.8	16.6	15.6	6¼
6½	47.0	33.0	27.7	23.9	21.2	19.4	17.10	16.9	6½
6¾	50.10	35.9	29.10	25.8	22.10	20.11	19.3	18.1	6¾
7	54.9	38.6	32.2	27.8	24.8	22.6	20.9	19.6	7
	58.11	41.5	34.7	29.9	26.6	24.3	22.4	21.0	

[Communication from Schott & Gen. in Jena.]

INFLUENCE OF THE PROCESS OF COOLING UPON THE OPTICAL PROPERTIES OF GLASS AND THE PRODUCTION OF PRESSED LENSES IN A THOROUGHLY ANNEALED STATE.

THE very imperfect state of annealing generally met with in the glass disks for larger telescopes, formed for many years past a constant source of complaint of such opticians who, in the manufacture of large sized lenses, are working strictly spherical surfaces. For this and other reasons it has been our aim, ever since the erection of our works, to improve on the process of annealing. The method hitherto in use, viz., that of allowing the temperature of the red-hot glass to fall in a kiln completely inclosed by brick-work, which gradually trans-

mits the heat stored up in it to the surrounding atmosphere, has been discontinued by us in all such cases where high optical properties are aimed at, and in its place we adopted the plan of storing the glass in a vessel the temperature of which may be accurately measured and subjected to a very slow and strictly uniform decrease, the duration of which may be adjusted to suit special requirements.

The experimental researches which formed the necessary predecessors of our new^{er} process of annealing offered ample opportunity for minutely studying the influence of internal strains and pressures upon the optical properties of the glass. We intend to treat in extenso on this subject at a later date; here it may suffice to mention the most important of those results which will interest practical opticians.

First.—Any kind of glass becomes strained, *i. e.*, the molecules of the glass are subject to tension, unless the process of solidification be extended over a very long period.

Second.—The refractive index of one and the same piece of glass varies according to the duration of the process of annealing; this diversity may extend to several units of the third decimal place.

Third.—If a lens or circular disk, on being carefully examined by means of polarized light, be found to yield a regular black cross, which remains perfectly free from any distortion during a complete rotation of the disk about the optic axis, it may be inferred that the tension is strictly regular throughout the entire piece of glass under examination. The presence of a moderate tension of this kind has no other effect than if there were a slight, gradual diminution of the refractive index in the direction of the axis. Owing to the symmetrical arrangement of the tensions round the axis, they do not exercise any detrimental influence on the image.

Fourth.—If, however, a lens or circular disk, while being turned round its axis under examination in polarized light, shows in any one or several positions a displaced black cross or any other irregular figure, the tension must be considered to be irregular. The influence of such tensions dissymmetrically grouped round the axis, is identical with that of a difference of the refractive power in different parts of the lens. Glasses of this kind should never be employed for the manufacture of large-sized objectives. With telescopic lenses made of glass where this defect existed in a moderate degree, many opticians attempt to compensate this differentiation of refraction by introducing at random deviations from strictly spherical surfaces through polishing, with the results of thus obtaining pretty satisfactory images.

By means of our method of annealing, we have succeeded in producing disks for object lenses having a diameter up to 35 cm., nearly perfectly free from tension, the entire surface of the disk being made to become efficient under the polariscope. All that is necessary during the test is to exclude any differences of temperature of the disks, as these are apt to give rise to temporary tensions. Nearly all disks annealed according to the older system show the distinct black crosses characterizing the presence of strain and pressure, even in those cases where the diameter of the disks does not exceed 12 cm.

Though it must be admitted that many opticians, before grinding large sized lenses for telescopes, will ascertain the properties of the glass with respect to annealing, yet we know from experience that there is considerable inclination to underrate the serious effects of tension and that many go as far as to consider examination before or after making a lens hardly worth the trouble.

We append to these lines a sketch of an apparatus, the principle of which is due to Professor Mach, of Prag, which may be readily put up and by means of which plane plates (Fig. 2) or positive lenses (Fig. 1) may be tested. The apparatus must be adjusted in such a manner, that with parallel Nicol prisms the eye at *E* sees the lens or disk to be tested fully illuminated; if now the Nicol prisms be crossed, total extinction will take place with glasses having no internal tensions, whereas with imperfectly annealed glasses the well known figures indicative of tension will present themselves.

In order to examine the figures due to strain or pressure in all positions of the prism with respect of the disk of glass, it will be found advantageous to turn both prisms synchronically rather than to turn the disks themselves, as these, owing to the touch of the warm hand, may become locally heated.

Fig. 1.

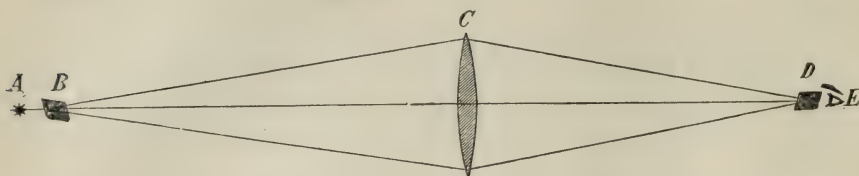
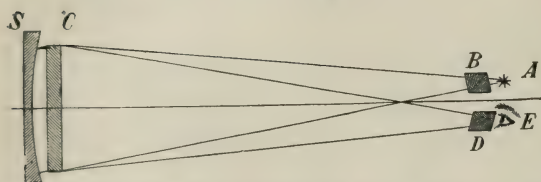


Fig. 2



A Illuminating source (bright-burning petroleum-flame). *B* Polarizing Nicol prism. *C* Lens or disk to be tested. *D* Analyzing prism. *E* The observer's eye. *S* Concave mirror. In Fig. 1 *A* and *E* are conjugate points with respect to the lens *C*; in Fig. 2 both points are situated in the plane of the center of the curvature of the mirror.

In order to better distinguish the present new method of annealing from that hitherto in use (raw annealing) we have introduced the term "fine annealing" when referring to the former.

PRESSED GLASS.

Our experiments and improvements made with regard to the process of glass-annealing have induced us to adopt for our fabrication the well known plan, worked in Paris since many years, of moulding the glass by pressing it while in a semi-liquid state between metal cups having as nearly as possible the same curvatures as the lens. Lenses produced in this manner are utterly useless for application in the better class instruments, if the ordinary quick process of annealing be employed, as the internal strain in the glass will generally be very great and sometimes may become so excessive as to cause the rough lens to fly into small pieces as soon as an attempt is made to grind it. However, with our new method of annealing, which permits of annealing at such low temperatures as to put deformations out of the question, ready means are furnished to produce lenses of this kind entirely free from internal strains by subjecting them, after having allowed them to cool down, to a second process of annealing in the above mentioned apparatus.

Wishing to remove a prejudice held by many opticians, we will not omit to distinctly state that the pressure exerted on the glass while in a semi-liquid state is by no means the cause of internal strain or pressure; on the contrary, the only source of these must be looked for in the accelerated process of chilling, which has to be made use of in order to prevent deformation.

The favorable practical results obtained by many opticians with glass prepared in this manner encourage us to recommend its application for all such cases, where large numbers of lenses of the same kind have to be made with various curvatures and diameters within the limits between 12 to 120 mm. The increased costs of glass prepared in this manner are amply compensated for by the saving of material and work. Lenses having the exact form of the desired lenses suffice as patterns. On account of the prolonged period of annealing we require as a rule a term for delivery from six to eight weeks.

[From *Photographic Answers*.]**A FEW NOTES ON THE FACTORS WHICH REGULATE EXPOSURE.**

BY G. W. COBHAM.

THE fact that there are only two things worse than a wrong exposure—namely, a bad plate and a faulty manipulator—may perhaps be a sufficient excuse for an article on a rather well-worn subject.

The necessary duration of exposure depends primarily on two things: (1) The amount of light actually thrown on the plate; and (2) The sensitiveness of the plate to that light. These two main divisions can be split up into others, taking first the amount of light thrown on the plate. This has two main subdivisions: I. The amount of light on the view. II. The proportion transmitted by the lens.

I. For the purposes of this paper the sun may be considered as the sole source of light. The amount of light received from the sun varies we say with the time of day and the season of the year—really it varies with the angle of the sun's elevation—and the difference in the amount of light and heat received causes what we call the seasons and the days. The difference of the sun's angle of elevation is, of course, caused by the movements of the earth; and the diminution in the amount of light and heat received when the angle becomes small is caused by the absorptive power of the earth's atmosphere, the sun's rays having to travel through more of it when the angle is small than when it is large. The following table, compiled by Bourguier, shows the relative intensity of the sun's rays at different elevations.

SUN'S ALTITUDE.	INTENSITY.	SUN'S ALTITUDE.	INTENSITY.
Degrees.		Degrees.	
0	6	25	5474
1	7	20	6136
2	192	30	6613
3	454	40	7237
4	802	50	7624
5	1201	70	8016
10	3149	90	8123
15	4535		

The elevation of the sun can be taken with a sextant, or it may be found from the Nautical Almanac, the latitude of the place, the time of day and the season being known.

But there is another factor in the case, namely, the density of the atmosphere. The above table is calculated for an average day; if the atmosphere were absolutely transparent the intensity would be equal to 10,000, and if absolutely opaque it would be equal to 0. We have at present no means of judging the opacity of the air apart from the amount of light received, so that resource is had to actinometers to test the amount of light received.

These have various forms, but the most useful consist of a sensitive surface capable of coloring in light and a permanent tint corresponding to that produced by the surface; the time it takes to do this is noted, and bears a fixed ratio to the amount of light received—care should be taken that the sensitive surface employed for the actinometer should have the same curve of sensitiveness when

exposed to the spectrum as that employed to take the view. When using gelatino-bromide plates to take the view, and albumenized paper for the actinometer, this is not the case and error results; for instance, it is possible to take a view by moonlight, but the actinometer when charged with albumenized paper utterly fails to register any actinic power in the light. The best way at present invented is, when using gelatino-bromide plates, to have some of the same emulsion spread upon paper with the addition of a reducing salt (usually nitrite of potassium or sodium); the action of the light is then visible. It does not necessarily follow that even the same emulsion will have the same curve of sensitiveness when developed and when printed out, but the difference is of no practical importance. It also makes no perceptible difference if the emulsion is not absolutely the same as that with which the plates are coated; because, practically, gelatino-bromide gives one general curve of sensitiveness.

We can now give our first rule. THE TIME OF EXPOSURE VARIES DIRECTLY AS THE TIME TAKEN BY THE ACTINOMETER TO REACH A CERTAIN TINT.

It is understood that the actinometer is held in the view; if that is impossible it must be held in a light which is judged to be about the same as that of the view.

II.—The proportion of light transmitted by the lens.

It must be obvious to all who have considered the matter that the light that reaches the plate must pass through the stop, and the larger the aperture of the stop the more the light admitted, and in direct proportion. The aperture is usually a circle, and as there is no direct method of finding the area of a circle by simple measurement, advantage is taken of the fact that the area of a circle is proportionate to the square of its diameter, to compare the different apertures; so that we have as our second rule—THE EXPOSURE VARIES INVERSELY AS THE SQUARE OF THE DIAMETER OF THE STOP.

Then there is another factor, namely, the distance the light has to traverse after it has passed through the stop. Now, light decreases proportionately to the square of the distance traversed, so that we can put as our third rule—THE EXPOSURE VARIES DIRECTLY AS THE SQUARE OF THE DISTANCE OF THE STOP FROM THE PLATE.

Another factor is the formation of the lens. This is too complex to enter upon in this article, but it has not much practical import on the exposure except in the following case: When there is a lens or system of lenses in front of the stop THE EXPOSURE VARIES INVERSELY AS THE FOCUS OF SUCH LENS, AND DIRECTLY AS THE DISTANCE OF THE STOP FROM THE LESSER OF ITS CONJUGATE FOCI. This, of course, varies with the distance of the object, but it is near enough for ordinary work to take the solar or equivalent focus.

Another factor is the amount of light absorbed by the lens. This depends on the number and color of the glasses, and the state of cleanliness of their various surfaces. This is manifestly not adapted to measurement, and must be determined for each lens experimentally; but it makes no practical difference in the exposure, only care should be taken to always have the lens clean.

2. The sensitiveness of the plate.

This is the most uncertain of all the factors, as there is no trustworthy standard of comparison, and it varies with the developer employed. Some operators also like a plate that would be usually called under or over-exposed. The only way is to take one view continually under the same conditions as to

light, etc., until the correct exposure is known; then, by means of the rules given above, the exposure can be calculated for any other view when the same plates are used.

Collecting the results into a general rule—

Calling the time taken by the actinometer.....	A
“ the diameter of the stop.....	D
“ the distance of the stop from the plate.....	F
“ the focus of the lens in front of the stop (if any).....	f
“ this focus, less the distance between the lens and the stop.....	f'
“ the sensitiveness of the plate, which must be found by experiment, and when once found is constant for that brand of plates.....	S

—the exposure will be equal to $\frac{A F^2 f' s}{D^2 f}$, or, for the benefit of unmathematical minds, multiply the time taken by the actinometer by the square of the distance of the stop from the plate, and, if there is a lens in front of the stop, by the focus of the lens in front less the distance between the stop and the lens.

Multiply the square of the diameter of the stop by the focus of the lens in front of it, and divide the result into the result of the first calculation, when you will have a number, which, multiplied by the constant for the plate used, gives the exposure.

All this would be very cumbersome in the field, and there is no reason why most of it should not be worked out at home as follows:

Focus a distant object and measure the distance of the top slot from the ground glass; measure the distance across the stop and divide it into the distance obtained as above, and square the result; do this for each stop and note the results—call these the stop numbers.

If you have a doublet lens it will be a little more complicated. After having obtained the stop numbers as above, remove the back lens, refocus and measure the distance from the stop to the ground glass, also the distance between the lens and the stop.

Having obtained the stop numbers as above multiply it by second focus, and divide the result by the sum of the second focus and the distance between the lens and the stop; this will give the true stop numbers for the doublet. Next:

To determine the factor: expose the actionometer, and multiply the number obtained by the stop number of the stop you are about to use, and expose plate after plate until you get one that has been exposed correctly; then divide the exposure given by the number obtained by multiplying the actinometer and stop numbers, and the result will be the plate constant.

Having once obtained this, all you will have to do to get the correct exposure for any view is to expose your actinometer and multiply together the actinometer number, the stop number, and the plate constant, and the result is the exposure required.

It is difficult at first to hit on the best spot to expose the actinometer, as the various parts of the view will probably vary in brightness. The only way is to remember the golden rule given by Captain Abney: “Expose for the shadows, and let the high lights take care of themselves.”

The foregoing notes apply chiefly to landscape photography; perhaps on some future occasion they may be extended to other branches. A word of warning to finish. Do not expect to succeed all at once, for if everybody were proficient from the first there would be no need of *Photographic Answers*.

PRACTICAL INTERPRETATIONS OF THE LAW OF CONJUGATE FOCI.

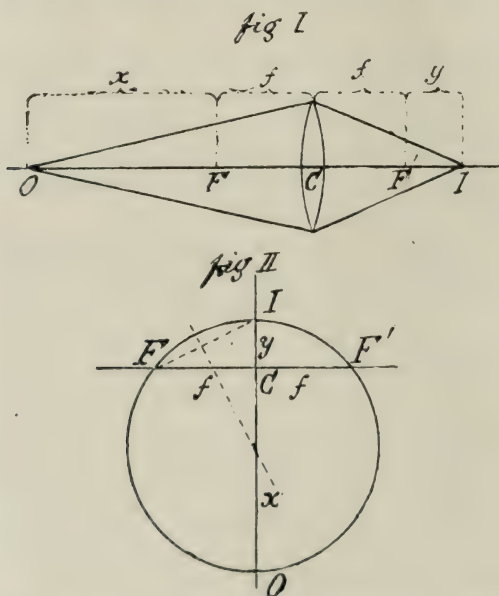
BY MR. T. R. DALLMEYER.

[Before the Camera Club.]

THE law of conjugate foci is one of the few simple laws that occur in the subject of optics. In its application to the use of photographic lenses, it is still more simplified in that converging lenses, or lenses forming real images only, come under consideration. Its main application is, with a given lens, to determine distances on either side of its optical center for positions of object and image, for enlargements and reductions. There is a further application which, I think, has not hitherto been considered to much practical purposes—viz., the application of the law to angular vision.

The first and essential accurate measurement necessary is the absolute focal length of the lens, and when this is known the interpretations of the law are readily understood. In the *British Journal of Photography* for this year I have given one of the simplest methods to determine this, and one that can be carried out in an ordinary room; for this reason I think it will become a popular one.

To describe the law of conjugate foci by reference to Fig. I, $f^2 = xy$. For



all practical purposes this is the only equation involved. The square of the focus for a given lens is a constant, and the distance y beyond the focus for parallel rays on one side, multiplied by the distance beyond the focus for parallel rays on the other side, is also constant. Again, whatever proportion of the focus y be, x will be that number of times the focus. If we have a 10 seconds lens, the square of its focus = 100 seconds, if $y = 5$ seconds, x must = 20 seconds. In other words, y being half the focus, x will be twice the focus, or generally if $y = \frac{1}{n}$ the focus, $x = n$ times the focus. Again, the same figures represent the proportions for the sizes of image and object, and as the positions of the conjugate points O and I are always interchangeable, the distances found for the case of reduction are identical with those for a case of enlargement, but reversed

as regards their positions from the optical center of the lens. Putting the law in this simple form, one sees the reason at once for the rule of thumb containing the expression "plus one," viz., for a given reduction with any lens the distance of the object from lens is the number of times, plus one, multiplied by the focal length of the lens; and the distance of the screen from lens is the reciprocal of the number of times, plus one, multiplied by the focal length of the lens, and *vice versa* for a given enlargement.

A simple graphic method to illustrate this equation is contained in the property of lines drawn within the circumference of a circle (see Fig. II). Draw two lines at right angles; on one line measure off the focal length of lens, say, 20 inches FC or F'C. On a line at right angles to this, measure off the proportion of this (20 inches) you wish to enlarge or reduce, say, four times; 20 inches divided by 4 is 5 inches, measure this distance on this other line CI, and complete a circle which shall cut both these points. To do this, join the two Points FI, or F'I, bisect the line joining them, and upon this erect another perpendicular. Where this perpendicular cuts the line IO is the center of the circle sought. Complete the circle. CI is the distance corresponding to y and CO, the distance corresponding to x as in Fig. 1, or here y given = 5 inches, x will be found to be 80 inches. Adding the focus to each quantity—distance of object = 100 inches from optical center of lens and 25 inches = distance of image from optical center of lens.

Generally the equivalent focus, or focus for parallel rays, is the mean proportional between the distances made up by the differences of the two conjugate points from the equivalent focus measured on the corresponding sides of the optical center of the lens.

Graphic methods based on this law are numerous, and the Camera Club has several in its possession; they are certainly pretty, although, the law being so simple, it seems hardly necessary to employ them.

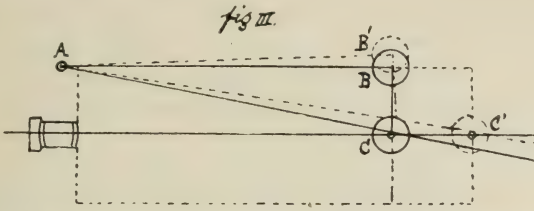
The application that I wish to dwell on chiefly is one whereby in using the camera with the sensitive film, ready to be exposed by the release of the shutter, one is enabled to know not only what amount of subject will be received on the film itself, but also when the object wished to be focused for is in focus. I believe the only satisfactory method hitherto adopted, in which there is a proper field of view, is by employing a pair of cameras with lenses of identical foci, similar to the method of using one side of the stereoscopic camera. This, of course, enables the whole field of view to be visible, and also accurate focusing is a simple matter. It has the objections of being cumbersome and expensive. I am aware that another method of a similar nature has been attempted in which the finder is a smaller lens, bearing a regular definite ratio in focus to the lens employed to take the picture, and is mounted on the side or top of the main camera, and has a system of multiplying or dividing wheels, so that the movement of the main camera back itself produces a corresponding proportional movement in the finder, and focus is obtained in this way. It is a nice piece of apparatus, but is, of course, a very difficult one to construct, in that an exact convenient proportion as regards the ratio of the smaller lens to the larger one, and a similar proportion in the movement by the wheels is a difficult matter. Another complicated method, although it is very ingenious, has been described by a gentleman in France, Mons. Berthon, and those who are interested in this I would refer to his paper on the subject.

I have heard from him that he has elaborated this, but he does not wish me to describe his method fully; but the principle is the same as that he has already described, and consists of two arms of a compass, which are made to open to their full extent when the nearest object ever likely to be taken with the camera is focused for, and they are quite closed when the lens receives very distant objects, or is in focus for parallel rays. The compass is viewed from the top of the camera, with the eye in a fixed position, the opening and closing of the arms being communicated by movement of the lens; and M. Berthon maintains that very little practice will make this instrument a very valuable aid as a focus-finder. The arms of the compass closed then correspond to parallel rays, and as any nearer conjugate point is focused for, these arms, opening more and more, will give an object which was a point at the extreme distance an appreciable angle, becoming larger and larger the nearer such a subject approaches the camera. The application is one of practice; for example, if a man's figure is at the nearest distance that will ever be chosen, and the compass arms are made just to include this figure in the visible angle, the farther a man recedes from the camera the less angle will be included, and as the lens is shortened in focus the arms of the compass will become nearer together, and when they just include the man at any given distance you are aware that the lens is in focus upon the screen. Of course, it is a question of practice, various well-known objects being gauged in this way, and, as in most moving life, one or other of these objects, such as a man, a horse, a dog, etc., is pretty well sure to be present for determining the focus required.

If the amount of subject visible in the object focused for is not large, a method mentioned by Mr. Traill Taylor in the *British Journal Almanack* is admirably adapted. It is a difficult matter to construct lenses of different forms of identically the same focus, and the method described by Mr. Traill Taylor is a means of obviating this difficulty, in that by employing two lenses, both of which are rather less than double the focus of the photographic combination, separated a little distance the one from the other, a position will be found when these two combined lenses, with this certain separation between them, will give accurately the focus of the optical combination. By applying then an ordinary eye-piece, and fixing this telescope on the top of the camera, an object can be picked out very accurately, the eye end of the telescope moving with the back of the camera. I have brought one constructed on this principle to show you, the object glass being ordinary spectacle lenses. Of course, an instrument of this nature, if made on the principle described by the late Professor Barlow, with a properly achromatized object glass, and instead of another positive object glass a negative achromatic lens, known as the "Barlow lens," in the place of the second spectacle lens, is a very perfect apparatus optically, but, as I have indicated, it has the drawback of a small field.

The last application of the law of conjugate foci that I wish to call your attention to is another and simple form of finding the focus, as well as showing at the same time what is on the screen, and you have before you an instrument to illustrate the invention. This construction is dependent upon the constant angle formed at the edge of a lens receiving parallel rays to its equivalent focus. This is a constant, or no error is measurable, so long as a focus is greater than the aperture, and in all photographic lines this condition is maintained. In Fig. III the bar *AB* is an ordinary rule graduated and pivoted at *A*, the bar *B* at right

angles to it can be set to the accurate equivalent focus of the lens. The diagonal bar AC is also pivoted at A .



The bar BC is fixed at right angles to the bar AB , then representing the semi-aperture of the supposed lens of the same focus as that explained.

If this is made accurately the aperture of the lens, the result in focusing will be correct. However, the error in comparison is so slight for an imaginary larger aperture than that of the lens itself in practical use, that it is immaterial unless the exaggeration in this respect be very great. The bar AB when set is parallel to the axis of the lens, and the bar BC of course at right angles to that. In the cross-bar AC there is the slot in which a pin fixed to the camera back can slide when the back is moved. For greater accuracy and to maintain parallelism, a bar can be adjusted parallel to AC when set to the correct ratio of aperture to focus of the lens employed, or as BC is to AB , and this second bar slotted and carried by the pin at C .

Two small finders are placed at the camera back, the one moving with the back at the top of the pin at C , the other mounted axially on the bar AB at B . For parallel rays the image on the screen is in focus, and in both view meters the same object appears centrally on the plate of both. If it be required to focus some nearer object, by wheeling out the camera back, the pin at C passes along the slot in the cross-bar, and throws the bar AB inwards, pointing toward some nearer object. When an object then is in the center of both view meters, you are assured that the lens itself is in focus on the screen.

A JAPANESE PHOTOGRAPHER.

THE DIFFICULTIES THAT HAD TO BE OVERCOME IN FORMER TIMES IN THE LAND OF THE RISING SUN.

BY W. K. BURTON.

I CAN scarcely expect that the readers of the BULLETIN will be vastly interested in the mere personal history of a Japanese photographer, however remarkable a man he may be, but I think that all will find some interest in anything that gives an idea of the struggles that had to be gone through by one who had made up his mind to devote himself to photography, in order to gain that knowledge that has been as an open book to all of us for so long, at a time that photography was scarcely practiced at all, and was looked on in no favorable light in this country of Japan that issued so theatrically out of its strange isolation but a few years ago.

It is with a sketch of the life of my good friend K. Ogawa, the founder of the Shashin Shimpo, the only photographic periodical published in Japan—or, for the matter of that, in the whole of the East by natives of any Eastern country—that I would try to interest your readers.

Ogawa's father was a retainer of Shimosano-Kami Matsudaira, Lord of Castle Oshi, in Saitama Musashi. Of the meaning of this formidable description it is sufficient to know that he (the father) was one of the proud military class who, from lording it with a high hand over all other classes, fell, on account of the revolution that upset the feudal system a little more than twenty years ago, to the position of mere citizens having often difficulty enough to discover the mere wherewithal to live.

Ogawa was born in 1860, just after Commodore Perry had negotiated those treaties between America and Japan which eventually led to the partial opening of the country to foreigners that now exists. Ogawa has some faint recollection of the revolutionary wars that ended in the fall of the Shogunate and the triumph of the Mikado; of going out on the field of battle with his father and being wounded in the foot by a spent bullet, of his sister carrying the spear with which ladies of that time were taught to fence, and the like.

The years during which a boy who has to look forward to his own exertions as a means of living were, in the case of Ogawa, the years when a great portion of "Young Japan" was first turning eager eyes to the West, and was looking to adopt Western civilization, instead of the feudal civilization which, although undoubtedly higher, in many respects, than any modern Western civilization, had become no longer possible—had, in fact, been already crushed out. Ogawa seems to have turned his attention at a very early age to acquiring English, feeling that through the channel of that language was he most likely to find some useful career. It was when he was fifteen that his thoughts were turned first to photography. He came across, in his studies, some books that were illustrated by the assistance of photography—he cannot remember by what process now—and from that moment he made up his mind that he would devote himself to the introduction of means of book illustration by photography.

But, how to get any knowledge of even the elements of the subject? He managed to become possessed of a book on photography in the English language, but alas! his knowledge of that language would not stretch to big and technical words.

It was difficult indeed to acquire a knowledge of photography in those days in Japan. The art had been, until a very little before the time that I write of, practically a monopoly in the hands of one Uchida, the oldest photographer in the country, who had learned it in the very old times from a Dutchman. Uchida must have made considerable hay whilst the sun of those times shone. He charged the modest sum of \$75 for a carte-size glass positive. It is true he got very few sitters, for there was a superstition among the Japanese at that time, that the taking of their photographs meant the loss of some of their vital energy. He used, however, to get very high prices from foreigners for photographs of Japanese, and made much money by selling such although he had to pay models to so far overcome their scruples as to sit to him. He afterwards, when prices came down from \$75 to \$5, took to instructing in the art for a high fee, and under a bond of secrecy. At the time that Ogawa turned his attention to photography Uchida was still the only purveyor of photographic goods in the country, and he must have made a pretty good thing of it—or some one must—to judge by the prices he charged. Here are a few of them. Nitrate of silver, \$7.50 an ounce; collodion, \$1 an ounce; sulphate of iron, \$2 per pound; albumenized paper \$1 per sheet! Not a likely time for a boy who had never even seen a

camera, and who was pretty nearly penniless to turn his attention to the practice of photography !

However, at last Ogawa did manage to get the sight, at least, of a camera, and that the camera of no less a man than Uchida himself. He thereupon went home, and constructed, with one of the lenses of an old opera glass that he had, and with a folding lantern, his first camera, but, as he could not afford to buy chemicals for preparing plates he had to confine himself to gazing at the image that he got on the piece of stretched diaphanous paper that he used instead of a ground glass, and this image was not much to look at after all, as he did not understand the necessity for a diaphragm to the lens.

Eventually the opportunity presented itself to Ogawa of employment with an actual professional photographer, one H. Yoshiwara. With him he remained about six months, and got some knowledge of the wet-plate process. At this time Uchida's stock of collodion ran short, and Ogawa, getting instructions from a teacher of chemistry in the capital, started the manufacture of collodion, using Japanese paper instead of cotton, and having, as may be imagined, difficulty enough in getting either. Everything else was readily obtainable. "No," he has told me, "the collodion was not good, but it was good enough for the Japan of those days, when, if anything at all was recognizable on the plate, it was enough."

The young enthusiast had saved \$25 at last, and with this he purchased a second-hand wooden sliding-body quarter-plate camera, with an uncorrected single lens, set in a wooden tube, and going home with a few chemicals, victimized the whole household, and especially his sister, to such an extent that they got sick of him and his photography, and not much wonder, seeing that on account of the very small stop that had to be used with the uncorrected lens, the exposure was two minutes in the brightest light he could get.

With this most unpromising outfit he set himself up, after his own relations would stand him no longer, as a professional photographer, making glass positives, carte sizes, at seventy-five cents each, and with such success that at the end of two years he was able to buy, for \$150, a quarter-plate camera with a Darlot lens. After this his success was still greater, and had his ambition been only to be a successful professional photographer, he had nothing to do but to go on as he was going ; but all this work was only as a means to that end that he had set before himself at the beginning, and he began to see that, without a very much more intimate knowledge of matters that were as yet only obtainable through foreign channels, he could not expect success, so whenever he had saved what he thought sufficient money, he left Tomioka in Kuzuki, where he had been practicing, and came to the capital with the sole intention of studying English from an English teacher. He studied there for a year, but at the end of that time his money was all gone, and the desired technical knowledge seemed to be as far away as ever. He resolved on a bold step. He would make his way to one of these foreign lands, where alone, apparently, was to be gained the knowledge he longed for, by hook or by crook, and would trust to fortune to be kind to him there and to send him back to his native land again.

Through the influence of some friends he was hired as a sailor on board the American Asiatic frigate "Swatara," Captain Cooper, on July 26, 1882.

It is curious to think of the youth who, had the old feudal system stood a quarter of a century longer, would have ranked above all except his lord, the

Shogun and the Mikado, and would have had all below his own proud rank bowing before him, working his way as a common sailor towards the most democratic of lands! and it is very typical of the Japanese mind, the complete equanimity with which he and the whole of his order took their reverses.

Ogawa speaks with affectionate recollection of all that he had to do with on board the ship, of his captain and of Lieutenants Tyler and Spicer. The men were all "kinder to him than he could ever believe they would be to a mere stranger among them." This is very creditable to the men, but also not a little to Ogawa himself, whose nature is such that it inclines all men to him.

Just six months after he entered the service Ogawa was granted his discharge and was landed at Washington, where again he received much kindness from Lieutenants Tyler and Spicer, who made him acquainted with those who could teach him what he wanted to learn. He remained about a year and a half in the States, and of his life there it will be sufficient to enumerate the firms with whom he was engaged, merely adding that all seem to have treated him with the greatest openness, holding back nothing.

At Boston he studied portraiture with Messrs. Rizey & Hastings; carbon printing and plate making with Messrs. Allan & Rowell. Collotype he studied with Mr. S. N. Mellin, of the Albert-type Company, at the same time visiting daily the factory for the production of Albert-types, heliotypes and copper plates produced by electrical deposit. This latter he was enabled to do through the introduction of Mr. Torry.*

From Boston Ogawa made his way to Philadelphia, and was there for some time with Carbutt, of dry plate fame.

It was while he was in the States, and through the introduction of his friend, Mr. Sakakibara, that Ogawa made the acquaintance of Viscount N. Okabe, a man of means, who saw the talent there was in the young man, and has since put at his disposal what capital he needed. Ogawa speaks of both with the most affectionate gratitude. I think it worth while to give a few of his own words with regard to them, as written in the notes that he has made for me—the English not always very correct, but always conveying the meaning intended—concerning which it may be said of a good deal of much more pretentious English, that it is a pity that it has not the same good quality:

"It is by both my dearest Viscount Okabe and Mr. Sakakibara's benevolence that I could get, and can hold, my present situation. I have truly no words to express satisfactorily my grateful feelings. I cannot recollect it now without thankful tears for their kindness to me."

Ogawa returned to his own country in 1884, and shortly afterwards established a large studio in Tokio, the capital. Since then his professional career has been one of uninterrupted success, a detailed account of which would be far less interesting to the reader than that of his early struggles.

He was soon after appointed Instructor in Photography to the Imperial Military Department; was a member of committee of a great exhibition of Weno in 1886; is connected with the Japan Dry-plate Company; has had the honor of photographing the heir-apparent to the throne—a far greater honor than people even of western monarchies would imagine; has received a medal for carbon printing, etc.

* I have all these names from Mr. Ogawa himself. Some of them are quite unfamiliar to me, and, as Mr. Ogawa is never very certain in the spelling of foreign names, it is likely that they may not be absolutely correct.

Last year he formed one of a great expedition that traveled over certain parts of Japan to unearth and make some record of the innumerable art treasures that were known to be hidden from the light of day in ancient temples, etc. During this expedition he made many hundred 12 x 10 negatives, and has since made many thousand platingtype prints from them.

At the beginning of this year he started the *Shashin Shimpō*, and was till recently editor-in-chief of it. Lately he has had to give up the editorship to Professor I. Ishikawa, on account of press of business.

It was not, however, till the summer of this year, and nearly fifteen years after he had set out on his journey towards it, that he actually reached his goal. At that time he established a photo-mechanical printing factory at No. 11 Yanagimara, Tokio. The first practical result that came from this place was a little collotype print that was used as a supplement to the *Shashin Shimpō*. Since then the place has got into full swing, and the best results are to be seen in the "*Art Journal of Japan*," which is illustrated by large collotypic reproductions of the photographs taken during the art expedition above mentioned. These are certainly as fine as—I sometimes think finer than—anything done by collotype that I have ever seen.

Ogawa might well be proud that he has been able, at the age of twenty-nine, to raise himself to the position of the greatest authority on photographic matters in his country, entirely through his indomitable pluck and perseverance, and in the face of difficulties that would have daunted by far the greater number of us. He has throughout been inspired with that true spirit without which there can be no real success, in which the mere making of money has been a matter of consideration entirely secondary to increase of knowledge and devotion to his art for its own sake.

The writer first made the acquaintance of Ogawa in the autumn of 1887, at Shirakawa, while the latter was giving assistance to the photographic department of the American Eclipse Expedition. A close friendship has existed ever since.

Ogawa is a very young man, and, as will be seen by the photograph that I send with this, looks even younger than he is. The photograph was taken only a few days ago, and is a remarkably good likeness. It will be seen that he is a man of remarkably intelligent and prepossessing appearance. His manner and conversation are as charming as his looks; he is a delightful companion, and a kindly, generous, upright and honorable man in all respects.

DODGE FOR THE SWING-BACK.

BY W. E. P.

Most photographers of any experience know how extremely difficult it is to get a swing-back perfectly vertical upon a hill side. If the day be windy even a stone and a string used as a plum line fail to give accurate results. The slope of the hill prevents one from seeing whether the bed of the camera is level, and distant objects do not enable one to sight with the accuracy that is desirable.

Of course every one says at once that a ten cent pocket level is necessary. Well, yes. But the level will not always show whether a thing is level, and as they have to be turned "fore-and-aft" and then crosswise, they take up time, and are only a little better than a string with a stone attached for a plum-bob.

A friend, who is fond of shooting, gave the writer an idea which was practical and satisfactory. In target rifle sights there are small levels set so that the rifle

may always have the sights vertical. The tubes for these levels are less than an inch long, and are very nicely made. Two of these tubes were obtained for a merely nominal sum, and mounted at right angles to each other in a small block of wood. They were sunk deep enough to be below the surface, and thus protected when carried in the pocket. A very pretty setting can be made from a circular piece of mahogany, $1\frac{3}{4}$ inches in diameter and an inch thick.

One only has to put this on the top of the swing back, or on the bed of the camera, as the case may be, and proceed to level. There is no fear that the sloping hillside has misled the eye. The saving of time is very great. And after using the level one is inclined to think that there is a gain in the appearance of the pictures themselves.

Those who are accustomed to working in metal can make a very neat T-level from two short pieces of square brass tubing. A small circular metal box makes a neat mounting for the tubes.

These level tubes can be procured at any of the larger establishments where fine guns are sold and possibly at many other places.

The convenience of using the simple little instrument is so great that no one who has once been possessed of it will ever care to be without it or depend again upon the eye or plumb bobs for finding a level.

EMULSIONS.

BY WILLIAM BELL.

[Read before the Photographic Society of Philadelphia.]

THE accompanying formulas, for the preparation of a gelatine emulsion for photographic purposes, are the result of several years of constant study and experimentation on the part of the writer, and it is believed that if the details of the process are strictly carried out with but an ordinary degree of ability, plates fully equal to the best brands in the market can be easily and uniformly prepared.

AMMONIA-NITRATE EMULSION.

No. 1.

Boiled water.....	1 ounce.
Iodide ammonium.....	5 grains.

No. 2.

Chloride ammonium.....	20 "
Water.....	4 drams.
Acid, nitric, a drop or two to render the solution acid.	

No. 3.

Nitrate silver.....	60 grains.
Water.....	4 drams.

To the nitrate of silver dissolved in the water (No. 3) add, drop by drop, the solution of iodide ammonium (No. 1), until the precipitate of iodide of silver formed ceases to dissolve in the solution. Then pour in the solution of chloride of ammonium (No. 2), wash the chloride silver formed with three separate waters, draining each time; then add some pieces of broken glass to the moist mass, and then 16 grains of Nelson's No. 2 gelatine, and dissolve with gentle heat (temperature 90 to 100 degrees). Shake well, and add the following solution:

Bromide potassium.....	43 grains.
Liquid ammonia.....	$\frac{1}{2}$ dram.
Water.....	4 drams.

Pour this solution at one time into the bottle containing the melted gelatine and chloride of silver. Cork the bottle to retain the ammonia. Keep at a tempera-

ture of 90 degrees for fifteen to twenty minutes. Test the emulsion by a drop on glass, looking through by transmitted light from a match to see if all reddish color is gone. When this has disappeared, and the emulsion viewed by transmitted light is grayish blue or green in color, the heating has proceeded far enough; and then 120 grains of Heinrich's gelatine (previously softened in water and melted at a temperature higher than 90 degrees) is added to the emulsion. This is to be well shaken, and then allowed to cool by gelatinizing it slowly upon the sides of the bottle. Let it stand six hours. Remelt at a temperature of 100 degrees, gelatinizing again upon the bottle. Allow to stand six hours, and melt once more. It is now ready to be mixed with the boiled acid emulsion (see following formula). Or, if the ammonia nitrate formula is alone to be used, the melted emulsion as just made is to be poured into a dish and allowed to cool and set; when cold placed on a clean cloth (mesh 1-80 inch), squeezed through, the finely-divided mass well washed, drained and pressed under weight to expel excess of water, remelted, filtered through white silk, and then coated on glass. The final amount should not be more than 3 ounces. If more, then the gelatine has absorbed too much water in washing; to avoid this, press longer. In preparing this emulsion it has been found that the presence of the bromide, with heat and free ammonia, favors the acid and alkaline emulsions. When the plates are coated they can be immediately passed through a small opening into an adjoining room, kept at a uniform temperature of 50 degrees, with free circulation of air, and dried either on racks or on nails on the wall, face outwards.

Glass—This should be previously cleaned by soaking it in a mixture of equal parts of nitric acid and water, well washed, dried on racks, polished with cuttle-fish bone and water, using a piece of well-washed flannel. This should be washed with a weak solution of soda, so as to remove any traces of oil or grease. The plates, after being dried, should be edged with a thick solution of gum tragacanth, by means of a small camel's hair brush tied to a short, thin stick, with the end of the stick projecting a short distance so as to act as a guide for the brush. The plates should then be stored in the hot room until wanted.

Filtering—If this is done in the hot room it can be accomplished by passing the melted emulsion through absorbent cotton. Otherwise a hot-water jacket should be used for the filtering funnel, and the emulsion passed through well-washed white silk or cotton.

ABOUT TONING ARISTOTYPES.

To the Editors of Anthony's BULLETIN:

Mr. C. E. Vredenburg, in his communication to the BULLETIN, states that in toning aristotype prints he "tried a peculiar bath referred to by me, but has given it up as unreliable." I have read over the article, "Certain Processes for Toning Aristotypes," page 76, to which Mr. Vredenburg alludes, and, as I was well aware of, I saw that Mr. Vredenburg had made a mistake, for he could not have tried a process recommended by me, since in the article in question I give no formula and do not refer to any special one—which, on the whole, was not necessary, as any photographer can devise in a few moments a gold compound, without thiosulphate, copper, lead, alum, etc., which will tone in less time than three-quarters of an hour—but I speak in a general way about the old discarded methods of toning and fixing positive proofs in one operation. To this I still object, and maintain that proofs treated by compounds similar to that

employed by Mr. Vredenburg are partly toned by sulphuration, partly by gilding, and are consequently much more liable to fade than those toned, then fixed in the usual manner. In this I am sustained by theory and the experience of photographers who years ago worked by that process, and by no less authorities than Messrs. T. F. Hardwich, A. Davanne and Girard.*

It does not follow that the proofs treated in this manner should fade very rapidly, nor that the sulphuration can be detected at once by the color of the image, which is similar to that obtained by gilding alone, for the chemical and physical changes which caused the pictures to assume a yellow coloration—in the half-tints especially—giving the appearance of fading, take, of course, a certain period to manifest themselves. I have in my possession photographs made some twenty years ago by Mr. Wherton Simpson's collodio-chloride process—now baptized by the queer name of "Aristotype"—which have stood pretty well the test of time, while others toned by the sodic aurous thiosulphate method in question have long ago faded.

P. C. DUCHOCHOIS.

The death of my old friend, Major Moulthrop, brought to my recollection that when I was teaching him the collodion process, in 1855 or 1856, I devised a printing process of which he often spoke to me as a good one. I do not exactly remember the *modus operandi*, having lost my note-book of that time. It was an albumen process and the toning was done by gilding—not, however, as we work it now. I will shortly make experiments to find it out, and report them to the BULLETIN.

P. C. D.

NEW YORK, March 11th.

POSTAL PHOTOGRAPHIC CLUB.

THE monthly album of the "Postal Photographic Club," journeying from Virginia to Massachusetts, recently passed through New York. It contains an excellent collection of sixty platinum, bromide and albumen prints. The opening beautiful platinum seascape is "Gleam of Sunshine," F. A. Jackson. This is followed, among others of equal merit, by four charming studies of child life by Miss C. Needles; an interesting combination print, "The Naturalist," by Le Breton, and a very fine flash on a "Night Blooming Cereus," by Max Hausmann. The club numbers within five of its maximum thirty; and has been fortunate in interesting clever and experienced photographers.

The accompanying note book, in which members vote on best artistic and technical print, and freely criticise and advise one another, takes the place of the local club-room for members who meet only in its pages. Professor Randall Spaulding is its President, Dr. C. Max Mueller, Westchester, Penn., its indefatigable Secretary.

PACKING DRY PLATES.

To the Editors of the BULLETIN:

NOTE FOR THE PLATE MAKERS.—Do not pack the plates without anything between them to protect them. A tiny splint of glass between two films spoils two plates. Give us good rectangular separators, and for goodness sake do not stick in between the ends a piece of cardboard, which is for ever jumping out of its place, after it has been the cause of a mark, which sometimes, yes often, has spoiled from three-eighths to half an inch of the ends of the negative.

A. M. DE SILVA.

* Hardwich's Manual of Photographic Chemistry, 7th edition, pp. 105 et seq. London, 1864; John Churchill & Sons. Davanne and Girard's "Recherches théoriques et pratiques sur la formation des épreuves photographiques positives." Paris, 1864; Gauthier-Villars. (A capital work to which the French Photographic Society awarded a gold medal in 1879.)

OBITUARY.

JOHN B. GARDNER.

ANOTHER veteran gone from the fast thinning ranks of those who began their professional career soon after the discovery of the daguerreotype!

When a man of sterling worth, after a long, busy and upright life passes to the great hereafter, his associates feel that a void has been left among them never to be filled. Especially is this feeling of loss made apparent by the death of John B. Gardner, one whose official position has brought him into intimate relations with the foremost members of the profession in New York and wherever his reports of meetings and other writings were read.

When fourteen years of age he left his native town of Beekman, Dutchess County, this State, and began his residence in New York City in 1839, the year of Daguerre's discovery. His first employment was in a wholesale commission house in Water street, where, after a few years, he found his strength insufficient for the work, and after severe sickness he accepted a position as apprentice with J. B. Thompson, a daguerrean artist, at the corner of Broadway and Chambers street. From there he next went into business for himself in Eighth avenue, between 19th and 20th streets. After some years he removed to Eighth avenue and 14th street. His next move was to Sixth avenue and 19th street. Here he remained until the march of improvement required the demolition of the building which he occupied, and he removed to a newly arranged studio, which he had fitted for portrait work, by side light alone, at the corner of Sixth avenue and 23d street. After a year's trial he became dissatisfied with his experiment, relinquished portrait work and removed to Fulton street, where the remaining years of his life were devoted to his special work of photography on wood, through which he became widely known among designers, engravers and others engaged in various departments of the industrial and pictorial arts.

During many of the later years of his life he devoted considerable time to the interests of the Photographical Section of the American Institute, where, in the position of Vice-Chairman and at the head of the Executive Committee, he found an ample field for the exercise of his talent in arranging instruction for his fellow-workmen and entertainment for large audiences who attended the section meetings.

After a long, active and upright life, John B. Gardner has left among his fellowmen a memory of one who did his part in the drama of life well.

O. G. MASON.

As we go to press we hear the sad news of the death of HERMAN H. GARDNER, the son of J. B. Gardner, and his only child. He died after a week's sickness of pneumonia, on March 15th, in the thirty-third year of his age. He returned from the funeral of his father in Dutchess County, N. Y., and went to the residence of his uncle, Mr. Resolvind Gardner, on St. Nicholas avenue, where he passed away just one week after the departure of his beloved parent. Thus in two short weeks the firm of J. B. Gardner & Son was wiped out of the photographic circles of New York.

OUR ILLUSTRATION.

WITH this issue of the BULLETIN we give a handsome photogravure reproduction of the portrait of Ogawa, one of the first photographers of Japan. The picture was reproduced from a silver print kindly furnished by Professor W. K. Burton, of the University of Tokio. We refer to Professor Burton's article in this issue of the BULLETIN for a very interesting account of the work of this enterprising man. See "A Japanese Photographer."

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.
and a corps of practical assistants.

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E. & H. T. ANTHONY & CO., Publishers.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

MEETING FEBRUARY 5TH.—(Continued.)

Mr. BURROWS had used the instrument, but not sufficiently to speak in regard to it. It could be used also in testing the light-giving capacity of different lenses.

Mr. Pancoast related an experience in making lantern slides. During warm weather he had been quite successful, but on the coming of cold weather he found it was impossible to get anything but a dull green tone or black gray without any life to the slide. Upon investigation he found this was due to the temperature; by warming the developer a little he increased the warmth of tone. If the developing solution was below 60 degrees the results were bad, but at 60 to 65 degrees satisfactory results were obtained.

Mr. Pancoast passed around slides and asked the nature of the deposit on the cover glass. The sky of the slide was covered with a crystalline deposit. The slides were made by Mr. Rau two years ago by the wet process, and were mounted in the usual way. They

were stored in a pine box without being separated.

Mr. Coates said this occurred in ten per cent. of slides, and would all rub off. It was in the covering-glass.

Mr. Rau had a box of slides made one and a half or two years ago, and on opening the paste-board box in which they were he found them covered with the same sort of deposit. They had been made on a fine quality of French glass.

Mr. Bell said that the cover-glasses of daguerreotypes were affected in a similar manner. The mercury with which the pictures were developed, he thought, afterwards evaporated and formed the deposit. If mercury had been used in any form on the slides this would perhaps account for it.

Mr. Rau said mercury had not been used.

Mr. Burrows suggested that slides be submitted for careful examination, microscopic or otherwise.

Mr. Suplee thought the deposit might be organic, and come from the gum or paste around the edges.

Mr. Pancoast thought it must be in the subsequent treatment of the slide after development.

Mr. Coates referred to metal bound slides that were being brought out in England.

Mr. Carbutt thought the remedy would be to coat the slide itself with collodion, and the glass too, before putting them together. The moisture that gets between the plates had a good deal to do with the trouble, he thought.

Mr. Wallace asked if oil or glycerine would not answer the same purpose as collodion?

Mr. Carbutt said he would not advise the use of glycerine, as it might get into globules.

* Mr. Rau asked if Mr. Carbutt did not think it was in the glass itself?

Mr. Carbutt thought that the chemical composition of the glass might have something to do with it.

Mr. Earle asked what would be the effect of using Canada balsam between the glasses, as it hardened and made a good medium for light to pass through?

Mr. Carbutt thought that would be a preventive.

Mr. Bell said balsam would necessitate the use of plate glass.

Mr. Coates found as lenses grew old they split apart, either by the balsam drying and becoming too thin to fill the space, or by some warping action—perhaps the contraction of the glass—requiring them to be taken apart

and re-balsamed. This would ruin the lantern slide.

Mr. Rau had a Ross portable symmetrical lens that had the same defect, and thought it must be in the nature of the glass.

Mr. Pancoast mentioned in that connection that lenses in India were particularly susceptible to the fungus growth, and only remained in condition a few years—due to the damp weather between December and April. It was a matter of heat and moisture.

Mr. Suplee thought it might be organic.

Mr. Cheyney thought that one of the slides showed decidedly inorganic matter that had taken the form of crystallization.

Dr. Mitchell said an article in a photographic paper he had read ascribed it to chemical action, the glass being actually etched.

Mr. Wilson had noticed the same defect in old opera glasses.

Mr. Coates moved that the subject be referred to the Executive Committee for further investigation. Carried.

Dr. Mitchell referred to an article by Captain Abney in one of the recent journals, in which he stated that on trying a color screen tinted with turmeric on some mountain views in Switzerland, in connection with ordinary plates, he found no advantage in the use of the screen. On repeating the experiment with a screen colored with aurine, however, and increasing the exposure thirty times, very satisfactory results were obtained.

Mr. Bell thought turmeric was adapted to the work with orthochromatic plates, and was as good as anything.

Mr. Carbutt said aurine was very much better under certain circumstances where the color must be held down while exposing for greens or browns, or reddish browns. A very strong color could not be gotten from turmeric.

Mr. McCollin had had occasion to copy a painting, and had made a color screen, using it in place of a stop. He had used picric acid. The stop itself was made of thin glass.

Mr. Carbutt said that while taking some views during a visit to the Lotus Club gardens at Bordentown, he became convinced that the proper place for the color screen was between the lenses.

Mr. Bell spoke of his experience in orthochromatic photography. He commenced by putting the color-glass in the diaphragm slot, taking thin mica and coating it with collodion. He had found no material difference when putting in either at the front or back, but thought it more convenient to put it in the back.

Mr. McCollin had treated a piece of mica, but found it altered the focus. It was thicker, however, than that used by Mr. Bell.

Mr. Bell thought it might be a question of eyesight.

Mr. Rau had used a piece of light orange glass, but could not get sharp focus with it.

Mr. Redfield had a box made with a groove back of the lens, in which he could slip the color screen, and when out in the field used it or not, as convenient.

Mr. Pancoast asked whether, in using the back combination of a Ross Portable Symmetrical Lens as a single lens, the stop was in the right position? A writer in one of the recent journals had said that, in using a lens in this manner, the stop should be moved forward so as to be one-fifth or one-sixth the focal length of the lens in front of the glass. In the portable symmetrical lens, if the stop was changed to this position, it would seem as if the light would only be admitted to the plate in almost parallel rays, so that only three or four inches square would be covered.

Mr. Redfield mentioned that Mr. J. G. Bullock had used quite extensively a 6-inch Ross Portable Lens as a single lens on a $6\frac{1}{2} \times 8\frac{1}{2}$ plate, and had made some of his finest landscape work in this manner.

Mr. Carbutt suggested the use of an adapter to change the position of the stop about $\frac{1}{2}$ -inch forward.

Mr. Bell had endeavored, in 1876, to get a lens of 40 inch focus to photograph the Centennial Buildings, etc., for Mr. Gutekunst, but, failing to find one, had used the back combination of a 21-inch Ross Portable Lens, the stop remaining in its normal position. As the temporary camera used allowed no adjustment or focus, the plate was fixed at 42-inch from the lens by measurement only, and the result was a perfect success.

Adjourned. ROBERT S. REDFIELD,
Secretary.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—J. R. M. writes: Please inform me through the BULLETIN as to what is a good black stain for wood or metal used in photographic instruments?

A.—For dead mat surface black use lamp-black and turpentine, with very little boiled linseed oil. For glossy surfaces use shellac varnish with lampblack.

Q.—T. R. B. writes: Will you please answer through the BULLETIN which is the easiest and plainest nitrate of silver bath? It should be clear and white, but mine is yellowish. I use animal charcoal and have to refilter the bath every other time of using it.

A.—The cause of your trouble is due to the use of impure water if bath is colored at the first solution of the nitrate. After using place bath in sunlight until quite dark, and filter through pure cotton; after this treatment the bath should be clear, unless the silver nitrate is impure. Don't use animal charcoal,

it always contains soluble organic matter, unless it is very carefully extracted before use.

Q.—D. H. H. writes: Would you please inform me and others through the *BULLETIN* the reason why eikonogen turns dark colored from one to four weeks after mixing with water, and the usual alkaline salts used in developers? Let the answer state how to avoid the change of color of the solution.

A.—In making the solution of eikonogen with sulphite of sodium and alkaline carbonate it will gradually absorb oxygen and become dark colored. But if the solution is made by first adding sulphuric acid to the sulphite solution until just acid to litmus, and then adding the eikonogen, the color remains unchanged for a long time. In this case the alkali must be put into a separate solution.

Q.—H. L. V. D. writes: I am being bothered a great deal lately by my pictures blistering in the hypo. I have used plenty of salt both before and after fixing, and have tried everything I know to prevent them blistering, but still they blister. Can you tell me through the *BULLETIN* some remedy for it? I can't account for it. I have not changed my way of fixing, but the last week or two my pictures blister badly. If you can tell me through the *BULLETIN* of a remedy I will be very thankful.

A.—The salt bath is the remedy generally used; but you must also be careful about the temperature of the various baths that you use. Don't have a toning bath at 70 or 80 degrees and a fixing bath at 40 or 50 degrees; and the salt bath should also not be cold. Keep them all within a few degrees of one another, say

between 60 and 70 degrees. The change of temperature of the prints from the change of baths is an annoying source of blisters.

Views Caught with the Drop Shutter.

C. H. CODMAN & Co., of Boston, notify us that on February 1st last Mrs. Abbie Codman Boude withdrew from the company, and is no longer a member of the firm.

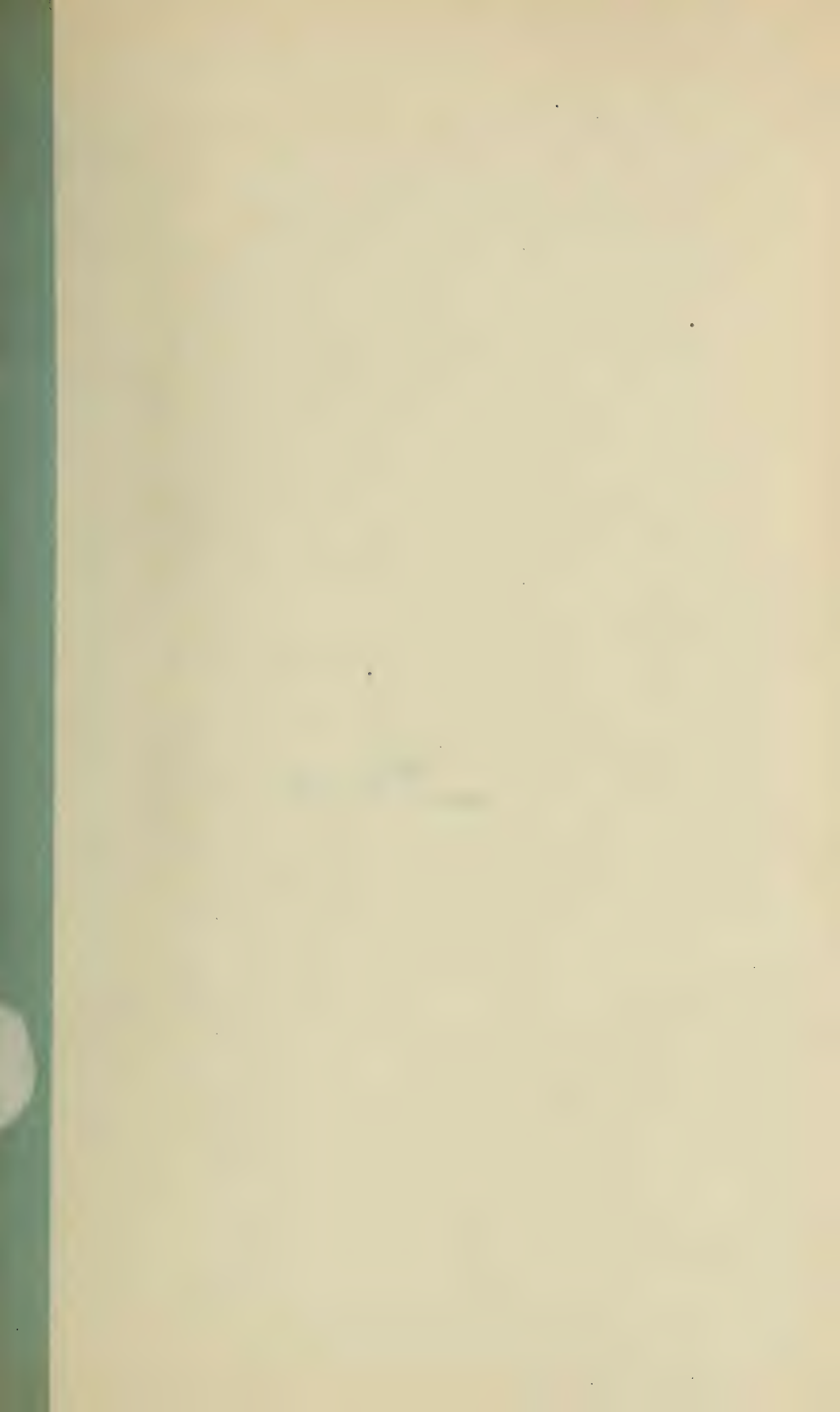
J. A. KNORR, of New York, after removing from Franklin street to Walker street, New York, has had the misfortune of being burned out soon after getting settled in his new location. We are sorry to hear of this, and hope that he may soon be in a position to continue business as heretofore.

WE note the incorporation of the Brooklyn Camera Company, with F. C. Breakspear, John C. F. Priest and George B. Glover as incorporators. The capital is \$6,000, in sixty shares.

GEORGE D. ROSENGARTEN, the founder and for years the active head of the extensive chemical works of Rosengarten & Sons in Philadelphia, died at his home, March 18th, aged eighty-nine years. Mr. Rosengarten was born in Cassel, Germany, and came to this country when eighteen years of age. A few years later he started in a small way the chemical works which are now among the largest and most important in the United States.—*New York Times*.

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A STUDY IN POSING.

ANTHONY'S Photographic Bulletin.

Prof. **CHARLES F. CHANDLER**, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

APRIL 12, 1890.

Vol. XXI.—No. 7.

PHOTOGRAPHIC EXHIBITIONS.

THE Camera Club of London has set itself the task of trying to formulate a set of rules in regard to the management of photographic exhibitions. Since these are now the order of the day it may not be unprofitable to note some of the propositions submitted by our English friends and discuss their application on this side of the water.

The first rule submitted by the Camera Club is: "That exhibition authorities and societies should decline prizes placed at their disposal for the purpose of advertising."

We have maintained this as a correct principle for some time, and much bad feeling and not a little disappointment would be eliminated from many of our larger organizations if this rule was strictly adhered to. We think that all officers of our photographic associations should decline to serve in any capacity in the awarding of prizes that are obviously set apart as wholly or in part for advertising. We do not think such prizes from manufacturers should be excluded from exhibitions, but their character should be distinctly known, and the rules for competing for such prizes should be a matter between the competitors and the parties offering such prizes. We remember some very fine pieces of photographic work, brought out by handsome prizes offered by manufacturers, and which we are satisfied would never have been made without some such encouragement. These manufacturers' prizes have an undoubted value if they are properly managed. They serve two very important purposes; first, they give an opportunity for the manufacturer to show what can be done by good workers with his particular lens, plate, paper, or other material, which in case it has distinct and valuable merits every one interested in photography has a right to know, and our exhibitions are an extremely convenient place to compare rival manufactures, tending to give the same results. The second purpose that these prizes serve is to give photographers an opportunity to work with new apparatus and materials, with little or no expense to themselves, since the manufacturers usually supply all the necessities for competing for the prizes. Nevertheless, these exhibits should be distinctly separated from all others, and their management should be independent of all officers of the organization under whose auspices they are made, except the mere designation of and payment for space occupied.

The second proposition of the Camera Club is, "that some restriction as to number of awards is required." This also is a good principle, but requires modification according to circumstances. The idea that nearly everybody should get some recognition because he makes an exhibit is absurd. When such a view is taken by authorities then men of the highest ability will not compete, because work of a lower order is indiscriminately judged of equal value with theirs by the people at large. Of course, the size of the picture is an index of the skill of the operator in handling large apparatus, and as such should receive recognition. But, it appears to us, that while this skill should receive the honor that it merits, it would prove much more satisfactory to competitors if only one prize was awarded to work of this character. At the present time the Photographers' Association of America, which is the only society of photographers that gives medals in the United States, has a number of classes in its exhibitions where the size of the picture serves as a basis of classification. This appears to us to be a mistake. Would it not be better to classify according to the character of the pictures, without regard to size? We have often seen small photographs at these exhibitions where some special subject has been treated with better success than in large prints, but which have been debarred from competition owing to being below the required size for that class. There are a great many good photographers who have excellent artistic ideas, but who are not the fortunate possessors of large lenses or cameras. We claim that the merits of the work of these men should be recognized in the treatment of subjects rather than in the size of the pictures which they exhibit. In a word, the class of genre pictures, for example, should include all sizes above $6\frac{1}{2} \times 8\frac{1}{2}$, and the best six pictures should receive the award.

These remarks apply with equal force to the competition for the grand prize for "Enoch Arden."

Classes B and C, portraits, appear to be fairly arranged, but two medals are surely sufficient. In competing in these classes it is only an aggravation for a competitor to receive a bronze medal, and we have heard this stated several times. It is better to have a small number of prizes of good value than a large number whose value is less.

While speaking of classes of pictures, we think it might be a good idea for the Photographers' Association to recognize photo-mechanical printing. This has become such an important application of photography that if a class was set apart to it, and a couple of good medals awarded, the exhibits obtained would form an extremely interesting section of the Art Department of the Convention. Perhaps the powers that be may find it worth while to consider this question. It is certainly as worthy of recognition as the improvement of apparatus.

The Camera Club also suggests "that awards shall all be of equal value." This is also a good idea, and, if the number of medals is limited, could be readily carried out at our Convention. For example, in class D of the Photographers' Association we have one gold, one silver and one bronze medal for landscapes; only one silver and one bronze for marines, and the same for architectural pictures. Would it not be better to give a gold and a silver medal in each of these sections of this class. We cannot see that marine or architectural pictures are of less value than landscapes, if they are done well, but according to the classification as now arranged they are rated so.

We firmly believe that it would be much better to have only gold and silver

medals in each of the classes, and in order to accomplish this, cut down the value of gold medals so that every class shall have one of the same value. How proud our good friend with his 5 x 8 marines would be if they captured for him a gold medal, if only the size of a ten dollar gold piece. We are sure that smaller medals, or those made of lighter metal, would serve the purpose, especially if the number is limited and the awards are made justly. Let it be distinctly understood that it is the honor of the award that tells and not the value of the metal in the medal.

Make the awards worth competing for by making them of equal value in each class, and only two in number. Furthermore, there should be no awards made unless there are at least two competitors.

The other points in the Camera Club's suggestions pertain to the details only of exhibitions, such as classification of landscapes, landscapes with figures, etc. The question of the selection of judges is a vexatious one with our English cousins, and they call for ideas upon this topic. We think the method of the Photographers' Association is a very good one. The president appoints one judge in each class; the competitors in that class select another, and these two select a third. This appeared to work well at Boston, and will be the rule adopted at the Washington Convention.

One other remark about the awarding of medals. It would be a very pleasant feature of our Conventions if the medals could be handed to the winners before the whole of the members while in session. It would afford an opportunity for some pleasant remarks by the officers of the Association, and give the members an opportunity of seeing those who are deemed worthy to bear the palms.

EDITORIAL NOTES.

A NEW form of albumen has recently been discovered by Professor Erich Harnack, of Hälle, Germany. It is made from copper albumenate, and has properties very closely allied to gelatine. With water it swells up and finally gives a clear solution. Boiling facilitates this solution, hence this so-called pure albumen is not coagulated by heat. It is believed that the coagulation of ordinary albumen is due to the presence in it of the mineral salts which form the ash. The new form of albumen made from copper albumenate leaves no ash. Alcohol, ether, and phenol also do not coagulate the pure albumen.

A NOVEL method of reproducing negatives comes to us through our French exchanges. A dry plate is treated with solution of potassium dichromate of about the same strength as used for carbon tissue. After exposure under a negative, as is well known, those portions that have been protected from light will absorb water, while those that have been exposed to the luminous influence will not absorb this liquid. If the plate is now immersed in an aqueous solution of some coloring matter, those parts that have not been exposed will absorb the colored solution and the others will remain uncolored. A dry plate is used according to the report, but a bichromated gelatine film without a silver compound in it should answer the purpose. Paper coated with bichromated gelatine and exposed under positives, such as tracings of engineers' drawings, would give positives in black lines on a white ground, if soluble aniline black is used as a bath. This is only a suggestion; perhaps some of our readers can try it.

DR. EDER has been experimenting upon formic aldehyde as an addition to the developer. Using hydroquinone or pyrogallol, he finds that when the aldehyde is added these substances can be reduced to about one-fourth of the usual quantities, and that the developers so made are very permanent. It was also found to increase the sensibility of the plates used about two degrees Warnerke, and the negatives were free from fog.

A REPORT comes from Klausenberg, in Austria, that a photographer named Varess has succeeded in making photographs in colors. As it appears, he has only succeeded in obtaining colors between orange and red, and these fade in two or three days. This part of the discovery (?) was known twenty or more years ago. If this is all the discoverer has to show, we are waiting for something more. We hope to hear more about this.

THE English Convention of Photographers will be held this year at the quaint old city of Chester, and under the Presidency of Professor C. H. Bothamley. The sessions will begin on June 23d, and end June 28th. There will be a number of excursions to places of interest around Chester. An exhibition of apparatus will be held during the time of the Convention, and no charge will be made for space. This last decision will be hailed with delight by manufacturers. Perhaps the Photographers' Association of America may follow the same example in the future.

ONE of the stage's effects of a play now running in New York turns upon the use of flash-light photography. An artless young girl thinks she will take the photograph of a ghost in a haunted room, and uses a magnesium flash to catch it. While doing so she unconsciously photographs two of the characters in the play in a situation of vital importance to the drama.

PRESIDENT J. M. Appleton, of the Photographers' Association of America, has appointed W. H. H. Clark, of the *St. Louis Photographer*, as a committee to report on the progress of photography in place of John Bartlett, who is unable to serve on account of ill health.

THE March Album of the Postal Photographic Club exhibits sixty-six prints, and is introduced by a positive film from W. H. Walmsley, which is instructive to the Club in showing what can be done on a film negative with a long focus lens pointed directly to the sun, and when carefully shaded. In this result there is no halation. Mrs. Jeanette Appleton exhibits, in bromide, the frontispiece to March number *American Amateur Photographer*, "Mid Winter." Mr. Cole has two quaint bromides that one could easily mistake for etchings. Perhaps the most taking picture of the month is A. E. Le Breton's "Primeval Man," an ideal boy bathing in a forest brook, with strong sunshine effects; while the one provoking most discussion is undoubtedly F. A. Jackson's "Italian Children," only two ragged little ones resting against an indistinct bank, focused in the school of "naturalist treatment," subordination of detail to breadth of effect.

DR. H. CARRINGTON BOLTON is now *en route* for the Hawaiian Islands, to continue his study of sonorous sand. He carries with him several cameras, and

also lenses of different foci, fitted with bayonet catch attachments, enabling him to rapidly change the lenses without unscrewing them from the flanges or using different front boards.

ENGLISH NOTES.

THE manufacture of dry plates appears to be scarcely a paying business just now in England. This is probably due to two causes—the first being the low rate at which such plates are now sold (twenty-five cents per dozen for quarter plates); and the second, the fact that the business is becoming concentrated in the hands of three or four makers, who, by dint of extensive advertising and great care in the manufacture, have contrived to attract the great bulk of purchasers.

These remarks are called forth by the announcement of the sale of stock (dry plates, gelatine, etc., amounting to a value of \$3,000), belonging to the bankrupt firm of Pollard, Graham & Co., of Derby, the makers of the “Derwent” plates. I went over this dry plate factory some four years back, when it was doing a large foreign trade, but the plates never seemed to suit the English market.

Another and much better known firm have also been “in difficulties;” but as they appear to have recovered themselves I will “name no names.”

The “cheap” gelatine dry plate may well be used in the studio of the professional worker, where the correct exposure can be gauged to the fraction of a second. Indeed, the principal fault—thinness, the result of a scanty modicum of silver—sometimes becomes there a virtue, as white draperies are better rendered, or rather will print better from negatives on such plates than from plates rich in silver, where the high-lights have an undoubted tendency to become chalky and void of detail. But for ordinary out-of-door work a plate rich in silver is a necessity, and such plates cannot be sold at a low rate. But besides the extra silver, when a reasonable price is charged for a plate, we also get careful coating and true cutting, together with good packing. At least we ought to—and as far as my experience with English-made plates goes we do—get these things.

My principle has always been, “Save or try to save in anything but plates.” Get the very best plates that money can buy. Just imagine the feelings of an artist or a scientist fifty years ago, if he were offered a coated surface that could secure and retain in the fraction of a second an image of any object, any scene that was placed before it. At what value would he not appraise such an article? And yet plates capable of doing such work are offered to us at two or three cents apiece!

Truly, the names of those who have done this great work—Niepce, Daguerre, Talbot, Archer and Maddox, to single out five men only—ought to be made known and held in reverence. It is with intense pleasure that I see that American photographers are about to raise a noble statue to Daguerre. I trust that it will not be long before we follow in their wake with memorials to our two great men—Fox-Talbot and Scott-Archer—who have passed away, and that something will be done to show my kind friend, Dr. Maddox, that the “children of the sun” thank him for the wonderfully sensitive medium—gelatino-bromide of silver—which he put into their hands in 1871.

The question as to amateur *vs.* professional is coming to the front on this side. It is, of course, in connection with competitions at exhibitions that the subject crops up; but the points to be debated seem to be only two in number. In the first place, who are entitled to be called "amateurs?" And, secondly, should there be separate classes for amateurs and professionals at exhibitions, or should they compete on an equal footing? With regard to the first point, it seems to me that we shall have to exclude every one into whose business or daily work practical photography enters as a means of livelihood from the ranks of amateurs. This would mean that, in addition to professional portraitists, all dealers, users of photo-mechanical processes, etc., should be called professional photographers; and it seems to me that they are such. In addition, all such amateurs as sell their productions—whether at, below, or above cost price does not matter—should be excluded from competing with the amateurs *pur et simple*.

As to the second point, I certainly think that distinct classes should be preserved at exhibitions for the two divisions of workers. For one reason it is rare, indeed, that a picture exhibited by a professional is his own unaided work; it has more commonly gone through six or eight hands before it reaches its final stage of technical excellence. In every other branch of work where individual prizes have to be competed for, a sharp line is drawn separating the amateur from the professional, and it seems but reasonable and best for both sides that it should be so in photography, also.

I have both good and bad news for American friends intending to visit England this summer. The good news is that the photographic convention will be held in the quaint old city of Chester—quite close to Liverpool—during the last week in June. A grand programme has been arranged, and any camera-carriers who can make their way there at the date named will receive a hearty welcome from some of the leaders of English photography, and an introduction to some of the most charming scenery in the world.

The bad news is connected with that shrine of Shakespeare—the church where he lies buried at Stratford-on-Avon. The vicar (Rev. G. Arbuthnot), whose proceedings have more than once called forth the remonstrances of those who desire ancient things to be "let alone," announces that the chancel of the church will be closed for three months, "to undergo restoration and repair." As the chancel includes the poet's grave and monument, I can only advise those who desire to see these memorials of the great dramatist to defer their visit till the autumn.

Several English camera makers now fit a very light, tapering, iron-weir frame-work, covered with a black material, to the ground-glass of their instruments. At the outer end (farthest from the glass) an opening is left for the eyes. The framework usually lies flat against the glass, but can be drawn out to any convenient distance from it. This makes a capital substitute for that great nuisance, the focusing cloth.

A pocket spectroscope is a useful addition to a photographer's laboratory. I am reminded of this by two little instruments of this class which now lie before me. The one I have had in my possession for twelve years, and it cost me \$12; the other was sent to me yesterday for inspection by an Edinburgh optician. It is certainly the better instrument of the two, and its cost, I see, is four dollars and a half! Such a spectroscope is most useful for testing the material of one's dark

room window, the ruby glass in a lamp, etc. One kind of ruby allows many blue rays to pass, and is wholly unsuited for dark-room use; it would be detected instantly by the spectroscope. Turning the little prism-bearer to the sky, it shows distinctly about a score of the Fraunhofer dark lines, which are always present in the spectrum of sunlight. But it also shows a faint dark band, which indicates the presence of much moisture in the air, and which has been called the "rain band."

The morning is fine, and I hope shortly to "take the camera out for a walk," but the umbrella and mackintosh will also accompany

TALBOT ARCHER.

LETTER FROM GERMANY.

Amateur Societies—Plotting Railroads by Means of Photography—Eikonogen Discussion—How to Pass Custom-houses on the Frontier with Dry Plates—Testing the Sensitiveness of Color Sensitive Plates—Red Glass for Dark Rooms.

New photographic amateur societies and new amateur journals seem to be the rage now all over the world. No matter what practical business photographers may say, it is a fact that amateur photography progresses daily, and amateur work is certainly more than childrens' play. I find oftentimes very valuable articles in their society proceedings. The Berlin and the Breslau societies have had a first-class jubilee exhibition, and the latter offers prizes for valuable scientific papers. In one of the last journals of the photographic societies of Switzerland, published in three languages—German, French and Italian—I find an interesting article about the service of photography in railway construction. Dr. von Würstenberger says: "It happens quite often, in projecting streets and railways in the highlands, that the plain sketches which even the best maps contain are not sufficient for a correct judgment of the suitability and choice of a route, the curves being mostly too near together to construct a profile thereof; and, besides this, no geological, particularly stratigraphical conditions, and best of all, cliffs, gaps and similar things, can be recognized on these maps, although they form oftentimes an important part in the construction of a road. Further, it is sometimes an object to possess quickly a cheap sketch of the territory through which communication is to be opened, while time and means are limited and not sufficient to enable the preparation of a topographical view. Such a case happened this summer while projecting the Säntis road. The route, as well as all maps and expense calculations, had been worked out from Appengell (789 m. above the level of the sea) to the so-called 'Wagenlucke' (1,904 m.). This 'Wagenlucke' was to be the end station at the so-called 'Grüne Bohl.' The financial institute having charge of the financial part of the enterprise now objected, asserting that the distance and the difference of elevation between this end station and the 'Säntis-spitze' was too great to consider the problem of a Säntis road in this manner as solved. To make it pay means must at all hazards be found to effect the transportation of passengers in a mechanical way from the 'Grüne Bohl' to the immediate neighborhood of the hotel."

No time being left for topographical views, and as an answer had to be given in the shortest time about the possibility of solving the problem, Dr. Würstenberger, in Zurich, member of Säntis Road Society and technical inspector of the enterprise, was ordered to prove the question. He organized now a photogra-

phic expedition to the Sántis, and was indeed enabled in the shortest possible time to give a satisfactory representation of the territory sufficient for all necessary calculations.

It was shown that the most practicable solution of the problem consists in a cable road, opening communication between the "Grüne Böhl" and the base of the rock, upon which the hotel is located. The power of locomotion was to be effected by electricity.

He proceeded as follows: At first a general view was taken from a point near the upper station of the cable road and pretty nearly in the line of the same and from which it could be seen to the "Grüne Böhl."

Its purpose was to prove that the route would perform a pretty straight line.

To characterize distinctly particularly important points, as, for instance, the position of the "Grüne Böhl," which, being at great distance, would be recognized only with difficulty on the photographic picture, one of the expedition was sent in that direction a little down the valley and ordered to hold his alpine cane vertically high. By signs of the hand, in a similar way as surveyors do, the young man was directed with his cane to such positions that the "Grüne Böhl" was delineated in a vertical line above the top of the cane on the ground-glass of the photographic apparatus.

After the general view was taken the expedition went to the valley side opposite to that of the road route, and here the whole opposite slope, with its rocky scenery, was taken from two positions, in a similar manner to panoramic views. The views being taken from several positions, a perspective distortion was prevented with good success, and by comparing the several pictures the proportions could be sufficiently explained. The territory upon which the upper depot is to come was determined by a separate picture. The territory so taken, showing some larger gaps which eventually would have to be bridged, serving as passages for snow slides, and smaller ones which had to be filled up by a stone wall, it was of importance to measure approximately the height and width of the same. A simple estimation was not advisable, because the most skillful is liable to make mistakes in the mountain regions. On the other hand, want of time and instruments interfered with a direct survey. The respective parts were taken therefore specially, whereby some of the young people, whose size was known, were sent to those rocks and cuts, with the order to hold themselves erect and stand near the rocks. The position of these men was chosen in such a way that they came to stand almost in the vertical plane of the projected route as well as its probable variations, and appearing with the rock upon the picture, could be taken as units of measure and living scales within the circle. The result of all the views was very favorable; the feasibility to construct the road and the route to be selected could be distinctly recognized; and from the photographic views it could also be seen that the road would have a pretty uniform grade of about 30 per cent., while the ground conditions, blasting, etc., would assume a favorable figure. This kind of photographic viewing, in consideration of the results gained, we can only recommend highly, and believe that even without a strictly photo-grammetrically executed view, many similar problems can be solved by photography. Such views, of course, as all those of a scientific nature, require skillful hands and a thorough knowledge of the matter.

I believe that problems, like the one described, might also be oftentimes in demand in the United States.

While eikonogen comes daily more into use abroad, we dispute here about the value of the new developer; and perhaps we will not be done disputing before another new developer makes its appearance. For this we have the best prospects. Here eikonogen is applied by first class photographers like Loescher and Petsch. Mr. Kühne eulogized this developer pretty well at the Photographic Society of this place, and he favors its application without any preservative like sulphite of soda, asserting that the sulphite of soda solution destroys the softness obtained with the eikonogen, that the fine tones are lost and a retarding takes place; but if the developer is conscientiously prepared and kept well corked the durability for ordinary gallery purposes would be sufficient.

Mr. Vogel, Jr., thinks that the preservative is necessary, the developer being apt to spoil easily within a few days without it, particularly during hot weather.

Neutral sulphite contains very often superfluous alkali; this has to be neutralized with acid sulphite, but no more should be added when the eikonogen solution commences to lose its green color. If too much is added the solution will contain free sulphurous acid, and this destroys a part of the alkali in the ready mixed developer.

Herr Haberlandt, who does not think so much of the superiority of the eikonogen developer, made the remark that the negatives exhibited by a manufacturer at the Exhibition could not have been developed by the same formula published by him, his result with the published formula and the same plates being different and less satisfactory.

The speaker finds, also, that hydroquinone gives only hard pictures in comparison with iron and pyro, which developers he prefers.

Mr. Vogel, Jr., replied that with the hydroquinone developer it was in one's power to obtain hard or weak negatives; weak plates required more hydroquinone. The speaker used exclusively hydroquinone and eikonogen developer—the latter for instantaneous pictures.

Mr. Haberlandt says hydroquinone and eikonogen, with addition of bromide of potassium (to prevent fog) developed too slow, and he could not wait a quarter of an hour for each picture. This view of slow development met with much opposition.

Mr. Kühne is of the opinion that Mr. Vogel, Jr. allowed too short a time for the durability of the eikonogen solution. The developer would keep well for over a week. Iron worked much slower, and eikonogen would develop the picture in six to eight seconds.

But the controversy did not come to an end herewith. The adherents of the old formulas boast a good deal. Liesegang has sent a query sheet to photographers to find out what developer they use. The results of the answers is that two-thirds of the photographers who were asked develop with oxalate of iron.

The same meeting gave information about the manner of passing photographic plates over the frontier without danger, which is recommended to American travelers in Europe.

Plates pay duty, the careless opening of the package by the custom-house officers not excluded.

E. Vogel hides his plates among underwear in the satchel. Vogel, senior, divided his plates into even packages, keeping one containing bad plates for opening by the custom-house officers, and thus saved the good ones. Mr. Wight carried plate boxes in book-shape, which were taken for books at the

frontier and passed free of duty. Knowledge of the language of the country through which the traveler passes is of great advantage.

Very often I have been asked about the difference of eosin and eosin silver plates. This is not as easy as it appears. The surest sign by which the latter may be known is its stronger yellow and weaker blue sensitiveness. The easiest way to determine this is by taking a view of a color table. But these differ very much according to the kinds of colors applied. I intend to produce a normal color table which can be had at a moderate price and shall serve for such experiments. With regard to testing the sensitiveness of eosin silver plates Dr. Michaels, of Breslau, says :

“The same way as it is optically difficult to find a general scale for the clearness of two differently colored surfaces, a comparison of a color sensitive plate with an ordinary one is also rendered difficult. One or the other plate will be found more sensitive according to the employment of more yellow or blue (in the white) light for the comparison. Otherwise the comparison should proceed after the example of optical photometry (after L. Weber) in two or three colors, perhaps in yellow, green or blue. The sensitiveness of a plate would, therefore, be determined only by its yellow, green or blue sensitiveness, and a comparison of two different kinds of plates would be possible. But even so, we would depend on the coloration of the light used for the comparison.

This matter is, therefore, not so simple. Warnerke's sensitometer, with its blue normal light, is for eosin silver plates completely useless. The simplest way in which I proceed is by taking an ordinary and an eosin silver plate side by side in a double camera and exposing upon an object showing no color but only gradations of black and white, as, for instance, a plaster bust with black drapery.

The complaints about the defective red glass in the dark room increase daily, and we would advise dealers to communicate with glass manufacturers who are in a position to furnish genuine copper flashed glass.

The red-gold glass (having a more pinkish color) will always admit actinic light. The best way to determine this is with the spectroscope. I carry always a pocket spectroscope when I purchase red glass.

BERLIN, March, 1890.

BLISTERS.

BY P. ERSLY, HILLSBORO, TEXAS.

AGAIN is heard the cry of blisters. Now, this is not surprising to me when coming from young printers; but when I hear the alarm sounded by the veterans, I must confess I am somewhat amused.

For the past ten years I have been trying to find a paper that would blister with my treatment. Others have sent me paper that troubled them, and I also have had prints sent me to tone. Well, I had no blisters. Would you like to know how I avoid them? Well, the discovery is not patented; neither is it for sale yet by having a little care, and paying close attention to business, you can readily learn it. First of all, paper seems to be more liable to blister during long spells of damp weather. Why? Because it gets too damp (I speak from a practical point of view—not scientific). Here one must learn to tell when paper is too damp to work well. This is easily done by trying two pieces, one damp,

the other dry. But this is not the greatest cause. The fixing bath is the developer of the pest. Now, I have so often treated upon this that I would not mention it again but for the fact that my views are in opposition to some of our most worthy and respected leaders. My excuse for my boldness is simply a wish to have the truth brought out. If I am not correct I want to know it.

Let others try my way, and prove or disprove the theory for themselves. I am using the N. P. A. paper. Now let me immerse one-half of a print in a fixing bath, made up two to sixteen, for a minute, and then reduce the fixing bath and put in the whole print. Blisters will appear on the first half immersed and none on the other. Now, does this prove anything? To me it does. And let me say right here, I believe in thorough fixing; but if two to thirty will fix a print in ten or fifteen minutes, why use four to twenty? Test it, please. I want my prints to appear fixed in ten or twelve minutes' time. Then leave them in the bath five minutes longer, and all is well.

Now, as other things help to make paper blister, I will give my treatment in full: Keep paper dry. Avoid having it too damp when you sensitize. Avoid too strong sensitizing bath. Use no acid in washing before toning. Use an alkaline toning bath. Fix in a bath two ounces soda to thirty water, with a very little ammonia added. I also add a little salt. Have plenty of bath and keep prints moving gently, so as to give them all the advantage of the soda. Learn to tell, by looking through them to the light, when they are fixed. Leave them in five minutes after they look fixed. Use salt in the first washing after fixing, and if you have blisters, please let me know. I don't have them.

ANTHONY'S CELLULOID FILMS.

BY DR. LEO BACKELANDT.

ONE year has elapsed since Anthony's films made their first appearance in the market. Many improvements have been accomplished since that time, and the actual film is in a very high state of perfection. Many of those who tried the first samples produced have observed that the negatives obtained by celluloid films showed, often, insensitive marks of greasy appearance. These marks appear in the developed negative as small transparent spots, or as irregular transparent lines. This evil seems to be still at this time a general calamity in the films produced by other makers, as the photographic journals show. These faults were not produced by the machinery used for coating the films, as they appear in the same degree when the films are coated by hand.

I observed that the spots were not so apparent when the films are coated with slow emulsions, but they become most discouraging when very quick emulsions are used. The fact that the same emulsions coated on plates give perfect results shows that the evil is due to the film itself.

My first idea was that the camphor used in the manufacture of celluloid had a bad action on the emulsion, but experiments have been made where camphor was dusted on a plate and left for several days, and after development they showed no trace of the action of camphor.

Having thoroughly studied this question, we succeeded, at last, in avoiding entirely the insensitive marks, and since that time the celluloid films are coated with emulsions as quick as can be produced. For instance, the films made lately show thirty numbers on Anthony's sensitometer, or about six numbers

more than the average extra-rapid plate. Other improvements have been made, also, in machinery for coating and cutting the films, and the machines fitted up now at Anthony's bromide factory at New York can produce a thousand dozens 8×10 per day.

The latest improvements will make the films a more general substitute for glass plates, as they possess many advantages over glass plates without any of their disadvantages.

Several photographers in the South have already adopted them in their studios, as they give beautiful results, without any sign of frilling in the hottest weather. Their higher cost, as compared with glass plates, finds a full compensation by their portability and by the exclusion of all chance of breakage. Retouching on films is just as easy as on plates. For development any developer can be used. The following hydroquinone developer gives excellent negatives and keeps very well :

Sodium sulphite.....	100
Hydroquinone.....	25
Potassium carbonate.....	40
Caustic potash.....	10
Potassium bromide.....	1
Water.....	1,000

A NOTE UPON EIKONOGEN.

BY W. E. PARTRIDGE.

SEVERAL experimenters who have been using eikonogen developers report that after a certain length of time development appears to stop entirely, the image going no further. For this reason it is recommended to add a portion of hydroquinone to the developer in order to maintain the action after the eikonogen has exhausted its power.

The idea that eikonogen is not continuous in its action and that by means of it development cannot be pushed to its utmost limit appears to be a mistaken one. While the experiments made apparently show this as a fact, it will be found that only a small change in the conditions are needed to produce continuous action.

There has been a very general habit among amateurs to use a small quantity of developer upon a plate, and with pyro to make a fresh solution for each development. Some persons go so far as to make fresh developer for each plate. Under this system 2 or 3 ounces were considered ample for a plate 8×5 inches. Those who used pans, fitting the plates closely, occasionally used only 2 ounces on a 10×8 .

Upon applying 2 ounces of eikonogen solution to a 7×5 plate, it becomes evident after a few minutes that the action which was rapid at first is growing very slow, and before a sufficient density has been acquired the developer has ceased its reducing action. In a word development has stopped short. Upon seeing this happen repeatedly, the general conclusion has been reached that the developer is incapable of continuous action. To illustrate the extreme form of this phenomenon make a bromide print, and after soaking place it in a tray and send half an ounce of developer across the paper, which may be perhaps 8 inches square. If the paper has had an ample exposure the image will flash out instantly. It may reach full density on the side first touched by the developer, but it will have less and less vigor until the opposite side has been reached,

where its details can scarcely be made out. The solution will seemingly have exhausted itself. In any event no further deepening of the image can be traced.

These peculiarities belong not to the eikonogen, but to the form in which it has been applied. It is the quantity of developer and not the chemical that causes the peculiar action. By using 6 ounces instead of 2 ounces for the 8 x 5 plate the result is entirely different. The most prolonged development will show that density is constantly increasing. With the bromide print, when 6 or 8 ounces are flowed across it there is no perceptible difference between the two sides. The portion last reached by the developer will apparently have the same density as any other portion.

It is a good rule to have the developer half an inch deep upon the plate or print. This assures an ample quantity to produce continuous action. It is somewhat difficult to frame a rational theory to account for this method of action, because it does not seem possible that the eikonogen contained in the liquid is actually exhausted or materially reduced. The developer in bulk will develop a number of plates with very little reduction in power between the first and the last. If, however, the liquid had been divided and each plate had received only its fractional portion, development of any one would have been impossible.

The high prices of the samples first obtained by the writer prompted economy in quantity. After having failed to make any development from a number of trials, each one of which was made with a small quantity, a new trial was undertaken, in which the volume employed was about equal to that which had been used for the fruitless trials. The result was a number of successful plates. Though the experiment was made some time since, it seems probable that the number of negatives which can be developed by a quantity of solution is greater than would be required to exhaust the whole if applied in small doses.

Careful estimates appear to indicate that the developer, used in liberal quantities, is economical, developing a large number of plates without sensible deterioration. The absolute cost of a given volume is practically the same as that of pyro.

THE CHEMISTRY OF COPPER AND ITS SALTS AND THEIR BEHAVIOR IN PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

COPPER (CUPRUM). CU.

COPPER.—Venus, as the alchemists called it in their figurative language—was known to the ancients. Next to iron it is the metal which in arts and manufactures is the most useful.

It occurs native, but principally as the red oxide and sulphide. To extract it, it suffices to reduce the oxide mixed with carbonaceous matters in appropriate furnaces. The sulphide should be first roasted to eliminate the sulphur and oxidize the metal, then melted as stated above. The process is long, however, and complicated. The space allowed to this paper does not admit of describing it *in extenso*.

Copper is a heavy metal—density 8.96—of a ruddy red color, very brilliant, sonorous, nearly as malleable as silver and gold, and exceedingly tenacious; in wires of 0.076 of one inch, it bears a weight of 274 pounds; extended in thin

leaves it is translucent, and absorbs all the rays of light but the green, which is seen by transmission. It melts at 788 degrees C. and then sensibly volatilizes, imparting to the flame a beautiful green coloration.

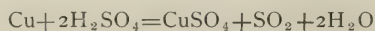
At common temperatures oxygen has no action upon it, but oxidizes it rapidly under the influence of heat to cuprous oxide, then to cupric oxide.

It decomposes water at red heat. In moist air it becomes covered with a crust, which consists of hydrate and carbonate, improperly termed verdigris, this being a mixture of basic cupric acetates.

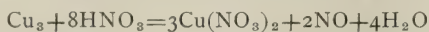
A concentrated solution of sodium chloride has little action upon copper, the dilute solution dissolves it pretty rapidly. Aqueous ammonia in presence of the atmospheric oxygen transforms it into cuprous oxide, which dissolves.

Strong acids, when diluted, attack it sparingly, and only with the intervention of oxygen; but the organic acids, acetic, malic, citric, tartaric, etc., dissolve it readily. The tinning of copper utensils used for cooking, whose invention, according to Pliny, is due to the Gauls, prevents this oxidation, and, consequently, the formation of organic and other salts very dangerous to the health of man.

Hot concentrated sulphuric acid converts copper into sulphate with evolution of sulphur dioxide:



Nitric acid attacks it violently, nitrous fumes being evolved:



Hydrochloric acid dissolves it with difficulty. Aqua regia transforms it into cupric chloride; thus:



Copper unites directly with chlorine, bromine and iodine. A copper plate exposed to the fumes of these elements yields a photographic image by development with mercury, as in the process of Daguerre.* It reduces the salts of the noble metals. Its own salts are reduced by zinc and iron. The former precipitates it as a black powder, the latter as red spangles. These actions serve to characterize it, especially when the quantity of the copper salt in solution is so minute that it escapes the usual tests; thus: if a needle be immersed in the liquid and the copper deposit not sufficient to be visible, the needle is dipped in a solution of sal-ammoniac, then heated in the flame of the alcohol lamp, which then assumes a green color.

Copper unites with nearly every metal. Its alloy with tin—brass—was discovered by the Aryans long before their migration into Hindostan. Among the other alloys employed in industry, the following are the most remarkable:

Ninety-two parts of copper and 6 parts each of zinc and tin give an alloy having the color of gold.

One hundred parts of copper and 25 parts of tin form the most sonorous alloy employed in the manufacture of bells, gongs, etc.

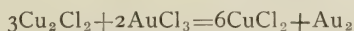
Ninety-one and four one-hundredth parts of copper, 5.53 of zinc, 1.7 of tin and 1.37 of lead constitute the fine bronze which was employed for casting by the celebrated founders, the brothers Keller (1743). It takes exactly the form of the mould by expanding in cooling.

The alloy formed by 80 parts of copper, 17 parts of zinc and 3 parts of tin is unalterable in the air. Its texture is very fine. It is employed for gun-barrels.

The pakfund, or white copper of the Chinese, consists of 40.6 parts of copper, 31.4 parts of nickel, 25.4 parts of zinc and 2.6 parts of iron.

The best French maillechort consists of 50 parts of copper, 18.75 of nickel and 31.25 parts of zinc.

Cuprous chloride, Cu_2Cl_2 , is grayish white, very oxidizable and sensitive to light. It is insoluble in water and alcohol, soluble in aqueous ammonia, sodium chloride, potassium iodide, ammonium sulphate, potassium cyanide and sodium thiosulphate. The ammoniacal solution is colorless and turns blue by absorbing oxygen from the air. It dissolves also in hydrochloric acid, forming a solution which possesses energetic deoxidizing properties, and, therefore, reduces silver and gold salts.



The reducing action of cuprous chloride is applied by Millon and Commaile to obtain chemically pure silver by precipitating ammoniacal silver solutions with ammonio-cuprous chloride. This method permits one to rapidly estimate the degree of fineness of the alloys of copper and silver, and also to instantly reduce silver chloride dissolved in aqueous ammonia. The ammonia cuprous chloride can be regenerated by digesting the filtrate with zinc filings in closed vessels.*

Nitric and sulphuric acids do not sensibly alter cuprous chloride. The alkaline chlorides unite with it, forming crystallizable salts.

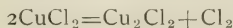
A copper plate immersed in a solution of cupric chloride, ferric chloride, dilute hydrochloric acid, or a mixture of this acid with potassic dichromate, becomes covered with a coating of cuprous chloride, which, by exposure to light, progressively blackens, assuming a metallic luster. If the plate so prepared is exposed under a negative one obtains a positive proof of great delicacy of details, which does not glitter.*

Cuprous chloride is prepared by precipitating cupric chloride by stannous chloride:



Cupric chloride, CuCl_2 . Anhydrous cupric chloride is yellow brown. The hydrate is green and crystallizes in prisms. It is deliquescent, soluble in water and alcohol, which then burns with a green flame.

Heated to dull redness it is reduced to cuprous chloride:



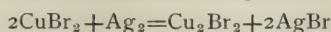
It is obtained by dissolving copper in aqua regia in excess, or by precipitating cupric sulphate with calcium chloride.

Cuprous bromide, Cu_2Br_2 . The properties of this salt are similar to those of the corresponding chloride. It is oxidizable, sensitive to light, soluble in the solutions of the same salts, in hydrobromic acid, dilute hydrochloric acid, and insoluble in the sulphite and sulphate of sodium and in potassic bromide.

“When a copper plate is submitted to the action of bromine fumes, or immersed in an aqueous solution of that element, it is coated with a film of cuprous bromide, which is altered by light in the same manner as cuprous chloride, but more rapidly and assuming a darker blue tint. The difference in

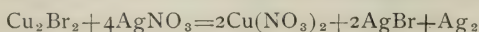
the solubility of the bromide altered by light and that of the non-acted on bromide in certain solvents are also distinct; thus: sodium chloride and sodium thiosulphate do not much alter the blackened substance, and, therefore, the impression can be fixed in the same manner as ordinary photographs." (Renault.)*

William Campbell has utilized the properties of the salt in question in the intensification of weak negatives. He prepares the cupric bromide by double decomposition, that is, by adding potassium bromide to a solution of cupric sulphate—1 to 2 of KBr—and applies it on the negative, whereby a white compound consisting of silver bromide and cuprous bromide is formed:



This he treats afterwards either with silver nitrate, ammonium sulph-hydrate, palladious chloride, etc., and thus obtains a black or brown-black precipitate of great intensity. If, instead of these reagents, an alkaline developer without bromide is applied, the reduction proceeds gradually, and is similar in color to that of ordinary negatives.†

The chemical changes with silver nitrate are represented thus:



The process for reducing the intensity of negatives devised by John Spiller is also based on the action of CuBr_2 on metallic silver, the salt being dissolved in a solvent of the cuprous bromide, which has little action on the argentic compound, thus allowing one to re-intensify the negative by development when its opacity is too much reduced. The following is the formula given by Mr. Spiller for gelatine negatives:

Cupric sulphate.....	4 parts.
Alum.....	4 "
Common salt.....	4 "
Water.....	32 "

to which is added, when the salts are dissolved, an equal volume of a cold saturated solution of common salt."‡ The alum in this formula has for its object the prevention of the softening action of sodium chloride on gelatine.§

Cupric bromide, CuBr_2 , is obtained by attacking copper with an excess of bromine in water. The solution is green, and deposits by evaporation in vacuo a dark-brown crystalline mass, which turns blue in the air.

The properties of this salt are similar to those of the corresponding chloride.

(To be continued.)

CONSTANT FOCUS AND DEPTH OF FOCUS IN PHOTOGRAPHIC LENSES.

To the Editors of *Anthony's Photographic BULLETIN*:

IN the BULLETIN of the 22d inst. I notice an article by Sir David Solomons, on "The Distance Beyond which all Objects will be in Focus with any Given Lens," in which he makes the following statement: "It is assumed that if all points in the object are represented in the image by circles having diameters of $\frac{1}{160}$ inch and less the picture will be sharp."

* B. Renault, *Comp. Rend.*, Vol. LIX, page 149. *Loc. cit.* page 558.

† *Anthony's Photographic BULLETIN*, Vol. VII., page 256.

‡ *Year Book of Phot.*, 1884, page 67.

§ A warm solution of NaCl dissolves gelatine even when made insoluble by chromic oxide.

Now, oculists agree that the chord that subtends an angle of one minute is the shortest line which is perceptible to the unaided human eye. And as the sine of the angle of one minute is $\frac{1}{2500}$ inch +, when the radius is 14 inches (the distance at which we usually look at a photograph), I therefore took $\frac{1}{2500}$ inch as the greatest allowable error in focus in the calculation of the table accompanying my article published in the *Journal of the Franklin Institute* for November, 1889, a copy whereof I herewith send you.

There is also an error in his formula, but as he does not show how he derived the formula, I cannot tell where he made the error.

Yours,

W. A. CHEYNEY.

[From the *Journal of the Franklin Institute*, November, 1889.]

Since the introduction of detective cameras we have heard and read much about lenses having a fixed or constant focus for all objects at all distances from the lens, from 4 feet upward, and this has led to claims being made for the lenses of different manufacturers, which have been surprising and at variance with all known laws of optics.

This condition of affairs induced me to make a series of experiments with a number of lenses made by different manufacturers, in order to convince myself as to what extent these statements could be relied upon, the result of which I give you, as follows:

There is no such thing as a constant focus for any lens: the plane of absolute sharpness varies for every point, at which the object may be, between an infinitely distant point and the lens.

That there is a plane of absolute sharpness in all well-corrected lenses there can be no question, and the determination of this plane only depends upon the extent to which the image on the ground glass is magnified.

There is, however, a distance through which the ground glass may be moved, and yet the error in the sharpness of the image cannot be detected by the human eye. This distance varies inversely as the ratio of the diameter of the aperture of the lens (the diameter of the opening in the diaphragm used) to the equivalent focus of the lens (the distance from the optical center of the lens to the ground glass, when an object infinitely distant would give an absolutely sharp image).

This grows out of the fact that the human eye cannot detect an error in sharpness when the error is not greater than $\frac{1}{2500}$ of an inch.

To illustrate this I present Fig. 1.

Here we have the cone of light from a lens working with an aperture of $f/8$ represented by the lines bd and be and the position of the plane of absolute sharpness by the line abc (being the position of the ground glass). Now, when the ground glass is pushed up to the position indicated by the line $fg hi$, we have what would be a mathematical point at b , increased to a blurred spot having a diameter represented by the line gh , and whenever the length of this

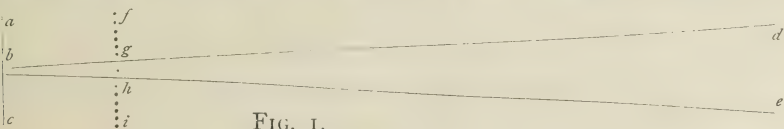


FIG. 1.

line gh is $\frac{1}{2500}$ of an inch or less, it will be impossible for the unaided human eye to detect the error.

But I stated before that this movement of the ground glass varies inversely as the ratio of the diameter of the aperture of the lens to the equivalent focus thereof, and in order to show this I will call your attention to Fig. 2, given below.

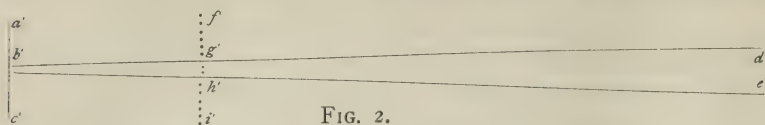


FIG. 2.

In this figure we have the cone of light from a lens working with an aperture of $f/16$, and the conditions are the same as in the former example, excepting that, while the line $g'h'$ is equal to the line $g'h$, it will be twice as far from the point b' as $g'h$ was from the point b .

Now, these conditions are true for a point back of the ground glass.

Here let me say that this distance from the point in front of the ground glass to the one behind it, between which the error in sharpness is inappreciable, gives rise to what is known as depth of focus in a lens, which is here shown to vary according to the ratio between the diameter of the aperture and the equivalent focus of the lens, and which depends for its existence upon the inability of the human eye to detect the error.

This accounts for the fact that our beautiful little negative, in which we have taken advantage of all the depth of focus of our lens, when it comes to be enlarged, gives an unsatisfactory picture. Why? Because we have enlarged the error of focus until the eye is able to detect it.

Still, there are some of us who do not desire to make enlargements from our negatives, and for the benefit of those I will go further with the results of my experiments.

I found the following rule to be true by actual experiment with lenses of nine of the most reliable manufacturers, as well as by computation :

Multiply the diameter of the aperture of a lens by the equivalent focus thereof; divide the product by the greatest imperceptible error, and to the quotient add the equivalent focus. The sum will be the distance of an object upon which a lens should be accurately focused in order that all objects beyond a point one-half of the above distance shall be apparently in focus.

Thus let f equal the equivalent focus, a equal the diameter of aperture, and e equal the greatest allowable error; then d will equal the distance of an object upon which, if the lens be accurately focused, all objects beyond $d/2$ will apparently be in focus :

$$\frac{a \times f}{e} + f = d$$

Or, say we are using a lens with an equivalent focus of eight inches and the $f/8$ diaphragm, then we have

$$\frac{1 \times 8}{\frac{1}{256}} + 8 = 2,008 \text{ inches} = 167 \text{ feet } 4 \text{ inches.}$$

Now, if we focus upon an object 167 feet 4 inches from the lens, all objects beyond 83 feet 8 inches will be in apparent focus.

Or again, if we use a lens, the equivalent focus of which is four inches, and use the $f/16$ diaphragm, we have

$$\frac{\frac{1}{4} \times 4}{250} + 4 = 254 \text{ inches} = 21 \text{ feet } 2 \text{ inches.}$$

And here, if we focus on an object 21 feet 2 inches from the lens, then all objects beyond 10 feet 7 inches will apparently be in focus.

As the result of the foregoing, I give the following table :

EQUIVALENT FOCUS IN INCHES.	DIAPHRAGM.	DISTANCE OF OBJECT Fo- CUSED UPON.		ALL OBJECTS IN FOCUS BEYOND.	
		Feet.	Inches.	Feet.	Inches.
8	f/8	167	4	83	8
8	f/11.31	125	8	62	10
8	f/16	84		42	
7	f/8	126	1¼	63	0⅝
7	f/11.31	94	8½	47	4½
7	f/16	63	4⅞	31	8½
6	f/8	94	3	47	1½
6	f/11.31	70	9¾	35	4⅞
6	f/16	47	4½	23	8¼
5	f/8	65	6¼	32	9⅞
5	f/11.31	49	3½	24	7½
5	f/16	32	11⅝	16	5½
4	f/8	42		21	
4	f/11.31	31	3	15	7½
4	f/16	21	2	10	7
3	f/8	23	8¼	11	10⅞
3	f/11.31	17	10½	8	11½
3	f/16	11	11⅞	5	11½
2	f/8	10	7	5	3½
2	f/11.31	7	11¾	3	11⅞
2	f/16	5	4½	2	8¼

By an examination of the foregoing table, two facts are seen : (1) that, while the focus shortens in an arithmetical progression, the distance of the object in focus decreases geometrically, thus showing the reason that short focus lenses have a greater depth of focus than those of long focus ; and (2) that the distance to the object in focus decreases directly as the diameter of the diaphragm is smaller, thus demonstrating the cause of the increase of depth of focus by the use of smaller diaphragms.

And, finally, you should know that the lenses used in these experiments were of the kinds known as rectilinear or moderate angle, wide angle and landscape, or single combination lenses.

THE ACTION OF LIGHT ON SILVER CHLORIDE.

BY ROMYN HITCHCOCK.

THE leading article upon this subject published on pages 66-67 of the current volume of the *British Journal of Photography* would not seem deserving of notice by me, since the results of my work are already before the public, were it not that editorial criticism often carries considerable weight even against the most obvious conclusions. I am unwilling to believe that a leading article in the *British Journal of Photography* could be inspired by animosity, but it would have pleased me better had my unknown critic been more considerate in asserting his opinions concerning the real and the prospective outcome of my work and shown less of a disposition to belittle what may or may not be worthy of more

serious consideration. Assuredly, it never occurred to my mind that I might tread on somebody's toes by publishing my results; nor did I intend to controvert any one's pet theories unless on a basis of experimental evidence.

The only question of importance to the reader or to myself is whether my results have thrown any new light upon the subject under discussion. My worthy critic says I have not. I do not quite see what his array of theories and suppositions has to do with the matter. They are interesting enough, but as they do not affect my results they are not to the point. As a student of science I have a right to object to criticism which has no more solid basis than opinion—not that it disturbs my own peace of mind, but because it is likely to prejudice others against results which I desire should receive fair consideration. Therefore, I object to such criticism as this: "We cannot help expressing the opinion that the task is far too delicate to be satisfactorily approached in this manner." Pray, in what manner would the writer prefer that it should be approached? Again, he says: "Whether the question of loss of weight can be imported into the argument as proof or otherwise is open to very grave doubts," since the discrepancies are too great, etc. Well, this same question was "imported" into the argument some time ago, so I find myself in pretty good company. It has seemed to others, as it still seems to me, that a very natural method to study the action of light upon the compound was to determine the loss in weight, and my critic's personal opinions apply as well to my predecessors as to me. But it has been my good fortune to get more definite results than any hitherto given. Perhaps these results endanger some pet notions of my critic. There must be some reason why he should try to damage my case by laying so much stress upon the discrepancies in my figures; or perhaps, not being a practical chemist, he fails to recognize their true value. Now, the discrepancies do not militate in any respect against the important general conclusion, never before reached, that there is a weighable and a very considerable loss of chlorine under the conditions of my experiments. The discrepancies are not in truth very great when we consider the uncertainties of all previous results, and the very small quantities operated upon. They are greater than they should be, however, for I have since learned why there is not a closer agreement among the figures of my first four experiments. But what has my critic to say of experiments with slips numbered 3 and 8? These show a difference of 0.2 of a per cent. The difference in three of the others is only 0.42 of a per cent.

When my critic comes to discrediting my results because "their mean shows a loss of weight which does not even approximately agree with either of the theories mentioned," of course, I can only say that I did not undertake to make my results agree with any theory. However, although they do differ by the enormous quantity of 0.4 of a per cent., they do not "show the futility of his (my) attempt" to determine what the course of decomposition is.

The most serious, the most unpardonable and unjust charge of all is that "so far as these experiments have gone, they neither prove nor disprove anything."

In reply I have only to say:

1. They prove that there is a considerable loss of chlorine when silver chloride is exposed to light, amounting in two parallel "discrepant" (?) experiments to, respectively, 6.0 and 6.2 per cent. of the weight of silver chloride, a fact not hitherto known.

2. They prove that the weight of chlorine set free is equal, within the limits

of experimental error with the apparatus used, to the loss in weight of the slips, another fact not hitherto known.

3. They prove that there cannot be an oxychloride formed.

Does my critic still maintain that they "neither prove nor disprove anything?"

I have no wish to overestimate the importance of my own work. Neither do I deem it incumbent upon me to be unduly modest when my results are unjustly condemned. I would gladly welcome any well-considered criticisms or suggestions which may aid me in working out a solution of the problem I have thus superficially attacked. The difficulties in chemical theory which my critic has indicated do not trouble me. When the ultimate effect of light is known it will be time enough to propose a theory. But the end is still far off. Many puzzling questions have already arisen, and I do not yet know how they are to be solved by analytic methods. This much I do know, however, that the action of light upon this compound is progressive through a long period of time, and the loss of chlorine exceeds 7 per cent., and may reach a considerably higher figure. Nevertheless my critic fears "that such quantitative methods as as I have already adopted will only lead to disappointment." Why does he think so?

U. S. NATIONAL MUSEUM, Washington, D. C., 1890.

OBITUARY.

FREDERICK GRAFF.

PHOTOGRAPHY has again lost one of her most earnest devotees. Mr. Frederick Graff, the President of the Photographic Society of Philadelphia, died of heart disease, after an hour's illness, at his residence, 1338 Arch street, Philadelphia, on Sunday, March 30th last.

Mr. Graff was for many years the Chief Engineer of the Philadelphia Water Works, and stood in the highest rank in his profession. He was born in Philadelphia seventy-three years ago, the son of Frederick Graff, the designer and engineer of the Fairmount Water Works, and it was in the office of his father that the younger Graff obtained that engineering skill that made him so prominent in his profession. He was for some time President of the American Society of Civil Engineers; he was also Vice-President of the Franklin Institute, Vice-President of the Pennsylvania Museum and School of Industrial Art, Trustee of the Building Fund of the Academy of Natural Sciences, also of the American Philosophical Society and the Historical Society of Pennsylvania. He was one of the original members of the Photographic Society of Philadelphia before it was fully organized, and presided at its preliminary meeting, held October 19, 1862. He was elected its first Vice-President November 26, 1862, and became President November, 1867, which office he retained three years. In 1870 he withdrew in favor of Mr. John C. Browne. He was chairman of the committee representing the Society at the "Sanitary Fair" held in Philadelphia in 1864, and to his painstaking care and energy was due in a great measure the success of the committee's work. Through the efforts of this committee over \$4,000 in photographs, materials and cash were raised for this patriotic object. In 1886, Mr. Graff was one of the committee in charge of the Exhibition held by the Society at the Pennsylvania Academy of Fine Arts, and he did his share toward

rendering the enterprise a complete success. In nearly all the excursions made by the Society for field work Mr. Graff took part and showed the greatest interest.

At the death of Mr. Joseph W. Bates, in 1886, Mr. Graff again became President of the Photographic Society of Philadelphia, which office he held at the time of his death. He was highly respected by all who knew him, and with his associates in the Photographic Society it has been said of him:

"Rarely has such sincere love and respect existed in any society for its presiding officer, and his loss is most deeply mourned by every member."

At the last regular meeting of the Society, the following minute in reference to Mr. Graff's death was put on record:

"The members of the Photographic Society of Philadelphia desire to testify to their sense of the great loss they have sustained in the death of their late President, Frederick Graff. They feel that by his death not only have they lost an efficient presiding officer, but that each one has been bereft of a dear friend, a sage counsellor and one who gave of his very best to promote the interests and well-being of the association. For nearly thirty years his official connection with the Society has been continuous—as chairman of the committee called to organize the same, then as a Vice-President, and serving two terms as President, he may indeed be called its father. To his untiring zeal for its welfare the Society is in a great measure indebted for the present high position it holds in the photographic world."

The Society then adjourned out of respect to the memory of Mr. Graff.

At the meeting of the Instruction Committee of the Pennsylvania Museum and School of Industrial Art, the following was adopted:

"*Resolved*, That in the death of the much-respected member of this committee, Mr. Frederick Graff, this institution has sustained an irreparable loss. His earnest interest in the varied work of the school, his wise and faithful counsel, his pride in the success of the school, will long be remembered; and each member feels that an honest man, 'the noblest work of God,' has passed from this community."

The grandfather of Mr. Graff was the owner of the house on Market street, Philadelphia, where Thomas Jefferson wrote the Declaration of Independence, and in this house Frederick Graff, the elder, was born.

In looking over the busy life of this truly noble man we are compelled to admire his work, and believe that all good efforts steadfastly applied make the world feel strongly that in the death of such men it has lost something that all its riches cannot replace. Such a life tells more for the good of those around it than all the power of wealth and luxury; and the memories it leaves with those who felt its influence will be full of the love and admiration that only death can obliterate.

OUR ILLUSTRATION.

THE handsome frontispiece which forms the illustration of this issue of the BULLETIN is from the studio of Mr. D. H. Anderson, of Broadway, New York City. Mr. Anderson is famous for his life-like groups, and this study in posing is certainly a telling evidence of his success with individual subjects. The prints also are remarkably good, the tone being of a very agreeable shade, and the latter shows in a striking manner what can be done with a good paper in hands that know how to manage it.

NOTES.

BY T. E. PAYNE.

1. A CORRESPONDENT complained recently that his prints looked smoky. If adding a little salt to the toning bath does not give the required brilliancy, he should make old toning bath acid with acetic acid, shake well and filter. Then to tone, take one-half or two-thirds old bath, one-half or one-third water, the required amount of gold, and make slightly alkaline with carbonate or bicarbonate of soda, not forgetting the pinch of salt. He will find toning easy and the resulting prints bright and free from fog.

2. G. H. T. and others complain of small, dark spots on prints. I was terribly annoyed for a long time with the same. Since discarding the use of blotting paper in silvering I have had a rest.

3. W. A. A. cannot get density with eikonogen. I am using this new developer exclusively in my gallery, and I think I could not be induced to go back to pyro. The ease and certainty of getting good results on any plates, as far as my experience goes, is sufficient relief to make one look many years younger, and one can show his hands and defy any one to tell your trade. The trade mark is a thing of "ye olden time."

I use the formula which is on the wrapper of the bottle containing the crystals. I try to overtime slightly, and then according to exposure, use from half to four-fifths old developer. With the latter quantity the development will be slow, but I have no fear of covering up the tray and leaving the negative for a half-hour even when necessary, using sufficient developer to completely cover the negative. The negative will be free from mottled spots and hardness will be a rare quantity. My negatives are much quicker printers than when I used pyro, and are also much improved in brilliancy and delicacy.

MUSKEGON, Mich., March, 1890.

THE NEW YORK CAMERA CLUB.

THE EXHIBITION OF PRINTS.

THE last day for the receiving of exhibits at the rooms of the Club will be Wednesday, April 9th, but they will be received on any day before that date. The exhibits need not be wholly the work of the exhibitor, as, for instance, the making of the print may be the work of a professional, and it is not necessary that they shall have been especially made for the exhibition.

The attendant at the rooms will take charge of any that are sent to the rooms on or before that day, between nine o'clock in the morning and six o'clock in the afternoon.

The committee respectfully requests exhibitors to place in the frame, above the glass, a card with the name of the exhibitor and the title of the picture thereon. In case there are several pictures in the frame, the card should have on it the name of the exhibitor and "frame 1," 2 or 3, as may be; a letter should be sent with the frame, containing the list of titles, following the arrangement of the pictures, thus:

FRAME 1.

"On the Bronx."
 "The Old Mill."
 "The Rapids."

"Children Playing."
 "In Central Park."
 "The Lake."

As a catalogue of the exhibition will be printed, the Committee will be much obliged to the exhibitors if they will send by mail, at an early date, to its Chairman, Mr. LINDSAY C. IVORY, at the rooms, a list of the titles of all their pictures to be exhibited.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.C.S.**
and a corps of practical assistants.

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THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting of the Society was held Wednesday evening, March 5, 1890, the *President*, Mr. FREDERICK GRAFF, in the chair.

The Secretary read a communication from Mr. W. E. Barrows, President of the Welsbach Gas Light Company, announcing that the company had fitted up a room at their factory in Gloucester, N. J., for photographing with incandescent gaslight, and inviting the members to make use of the room, and to visit the factory and witness the manufacture of the light. On motion the invitation was accepted with thanks.

It was also announced that pictures from this Society for the Newcastle exhibition might be sent unmounted. They would be mounted by the committee in charge of the exhibition at a trifling cost to exhibitors. It was requested that exhibits be forwarded as early as possible to allow ample time for mounting, etc., after arriving at destination.

Mr. Stirling, Chairman of the Lantern Slide Committee, reported satisfactory progress in

the preparation for the exhibition to be held March 12th, and the prospects of a fine display of representative work of the members.

At the last conversational meeting slides had been shown from the Chicago and Newark Clubs, each sending fifty slides. Slides were also shown by Messrs. Dillon, Mitchell, Wood, Hanawalt, J. H. Bradway, Sullivan, Marcellus and Fulmer.

Mr. Stirling also announced that forty-three English slides, representing the Society's share of the one hundred sent to this country by the Camera Club of London on account of the last English Interchange, had been received. They had been selected by lot impartially, and after the meeting would be distributed in like manner to the ten members whose slides had been selected to send abroad. The members entitled to receive slides with the number due each, were as follows: C. R. Pancoast, 6; George Vaux, Jr., 4; Ellerslie Wallace, 4; John Bartlett, 2; E. W. Keen, 1; J. H. Burroughs, 1; R. T. Hazzard, 2; W. D. H. Wilson, 2; W. H. Rau, 8; J. G. Bullock, 5; John Carbutt, 2; Robert S. Redfield, 6.

Mr. Stirling stated that hereafter the Interchange slides to be sent abroad would be simply loaned, the idea of permanent exchange having been abandoned, so that eventually each member would get back all slides loaned to the Interchange.

The Committee on Membership reported the election of Mr. Henry Troth as an active member.

Mr. Bell presented a paper on "Gelatine Emulsions." On introducing the subject, he said he thought that it was the late president of the Society, Mr. Bates, who was first in this country to bring into use the gelatine plate. In his frequent trips to Europe Mr. Bates had had Mr. Kennett prepare some of them, and they were brought over. It was a long time before Mr. Bell had heard of anybody using them here. The next one he heard of making emulsions was Mr. George W. Hewitt. He himself had also been more or less engaged in searching for gelatine emulsions. The next one that was successful was Mr. Carbutt. Not having himself been successful he did not claim anything. Mr. Hewitt's plates were very good.

Mr. Bell then proceeded to read his paper, which, he said, was the result of a good many years' experience.

At the conclusion of the reading, Mr. Bell said that if any of the members were "chemically inclined" he would ask them to take

the No. 1 formula, and test it to see if it was what he claimed for it.

Referring to the sensitiveness of plates, Mr. Carbutt asked: "What does 40 or 80 mean?"

Mr. COATES—I think it means the gullibility of the buyer. I have bought "40" plates and found "20" much better.

Mr. BROWNE—Mr. Bell, in the early part of his paper, alluded to Mr. George W. Hewitt's experiments. So far as I know, Mr. Hewitt was one of the earliest experimenters with gelatine plates, and certainly Mr. Hewitt's process and the results that he succeeded in obtaining were very remarkable. There was one peculiarity about his plates that I have never seen in any purchased plates, and that was that the appearance of the image was more beautiful than I have ever seen in a commercial plate. The appearance of the image was slow and remarkably beautiful. I think Mr. Carbutt saw some of them. I do not know that Mr. Hewitt claims anything original in that process, but there was one difficulty in his plates which was a very serious one, and which he was never able to overcome, that was the liability to frill. I used many of his plates, but there was that uncertain character in the matter of frilling which made it to me very disagreeable. I think that in the future Mr. Hewitt will always receive credit as being one of the very earliest experimenters in gelatine dry plates.

Mr. BELL—Mr. Hewitt developed the gelatine plate precisely as a collodion dry plate, bringing out the details and finishing with ammonia sulphate of iron and silver.

Mr. SUPLEE—Do you think there is any advantage in that?

Mr. BELL—Oh, none at all; you can get all the density you want without it.

Under the head of "verbal communications," Mr. Carbutt referred to the subject under discussion at the previous meeting—that of deposits on the cover glass of slides, saying that he had received a number of slides from Mr. Pancoast, accompanied by a letter, in which he said: "Referring again to the incrustation on lantern slides, I was looking over some old slides I made in 1883 (possibly 1882), on some of your A plates, and find them in A1 order, no discoloring, mould, or incrustation whatever. They were not varnished or protected in any way, and were subject to the same conditions as the one I showed you at the society." In another letter of a later date to Mr. Carbutt, Mr. Pancoast wrote on the same subject: "I send you by this mail one of the lot I spoke of in a previous

letter in order that you may see how perfectly it has kept. It was in the same box as the other slides and subjected to the same conditions as those which show such a marked incrustation. I think the glass is B. P. C., at least the plates were your regular A plates. These slides were made by contact printing, and developed with oxalate."

Mr. Carbutt showed a "blue-print lantern-slide" sent him by Mr. Barbour, of Chambersburg, who had published the method in one of the journals.

Mr. Bell called attention to a portion of the report of a previous meeting in which the words occurred, referring to the use of turmeric for color screens for orthochromatic plates: "Mr. Bell thought turmeric was adapted to the work with orthochromatic plates, and was as good as anything." He desired to say that he distinctly stated that turmeric could not be relied upon unless freshly prepared.

Referring to orthochromatic photography he showed a screen of brilliant yellow, prepared by Mr. Ives, and loaned by him. It was put behind the lens, holding back blue rays and allowing the yellow to act more strongly on the plate. It was necessary to have a plate specially prepared, as the ordinary plates would not answer. It should be an orthochromatic plate. He showed two glasses in illustration of his remarks, saying that turmeric would not answer.

Continuing, Mr. Bell showed the same color screens he had obtained in London last year. One was of pot metal, ground and polished like plate glass, and which he said would never fade. He had three tints, but finding one was too light, he had cemented two together with balsam of fir.

Mr. Redfield showed a screen similar to that of Mr. Bell's, made by Mr. Ives. He also showed the front board of his camera, and the slide in which the screen was placed. It was a double glass prepared by Mr. Ives; another method was a circular piece of glass prepared by Mr. Carbutt, which was dropped in the front of the lens, and a strip of blackened leather slipped in front of it, acting as a spring, and keeping the glass in position. Probably an improvement would be the introduction of some springs bracing the plate squarely against the back of the lens so as to prevent its being at an angle, and thus producing distortion. A still better way would be to coat the surface of the lens with some coloring matter, or have the lens made of some colored glass, as suggested recently in one of the English journals.

Mr. Cheyney said he had found it utterly impossible to get a sharp image, focusing first and putting the screen in afterwards. If focusing was done without the screen, and then the screen put in, the focus would be altered and thrown back as far behind as the thickness of the screen.

Going to the blackboard, Mr. Cheyney illustrated his remarks by diagram.

Mr. Suplee asked what would take place if placed in front of the lens.

Mr. Cheyney said the change would be very slight.

Mr. Carbutt suggested the preparation of thin films of colored collodion attached to diaphragms of black cardboard, and used in place of the usual diaphragms.

Mr. Redfield thought two pieces of thin black rubber could be used.

Mr. Carbutt said he had suggested cardboard because it could be obtained so easily.

Mr. Bell said he had already gone over that process, and found the collodion film was too brittle and curled all up.

Mr. Carbutt said it was not properly prepared then. It had a natural tendency to curl, but not to such an extent as to preclude its use. If 5 per cent. of castor oil were put in it would remain firm.

Continuing the subject of orthochromatic photography Mr. Carbutt showed some prints illustrating the excellent keeping of the plates, and also a photogravure print made by a publishing house in Boston from a negative on one of his orthochromatic plates. The print was from an old painting, and had a remarkable brilliant quality with correct color tone.

Mr. Tathan asked if any one used Vogel's eoside of silver plates? He had tried them and found them very slow; about as slow as a Carbutt A.

Mr. Stirling reported from the Executive Committee that the catalogue of the library had been completed, and copies could be obtained. The work had been a very laborious one, and the credit for the very careful catalogue was due to Dr. Ellerslie Wallace. The library belonging to the Society was exceedingly valuable, and there was probably no collection of photographic books in America that was as complete as that of the Society. Mr. Stirling placed a copy of the catalogue on the President's desk.

ROBERT S. REDFIELD,
Secretary.

Don't let the magazine stop coming, for I don't see how I could well do without it.

W. F. WILLIAMS.

BROOKLYN INSTITUTE—PHOTOGRAPHIC DEPARTMENT.

THE department met March 11th, in the laboratory lecture room of the Institute, *President* ALEXANDER BLACK in the chair. He announced the addition to the rolls of fifteen new members within the past month. The minute book of the secretary showed general satisfaction and success in the ranks of this institution, and the audience which thronged the hall and overflowed the seating space attested its popularity with the people of Brooklyn. It is worthy of mention that the membership of the Department of Photography is recruited in the main from the youth of the Institute, a fact that distinguishes this section, the other departments being well represented in disciples of the sere-and-yellow-leaf school of students. It is also noticeable that the fair sex are well represented on the roll books of the photographic section, and numbers of them may be seen trooping toward the Institute, with their escorts, on the night of the monthly meeting.

One of the several interesting features of last evening's meeting was the paper on "The Use of Sulphites in Photography," contributed by Professor Arthur H. Elliott, Ph.D., of New York. The paper was of a decidedly technical and scientific character, and dealt with some of the best and most feasible modes of producing successful negatives. He awakened considerable interest among the members of the department by tracing the chemical processes employed in "fixing a negative" and by tracing the photographic chemistry from its crude genesis and resort to the common salts, to its triumphs now universally employed.

Professor Elliott said that the very earliest process employed was that of common salt and ammonia, but as the science progressed it was found that these substances marred the picture. As early as 1819 Sir John Herschel discovered qualities in hyposulphite which gave it strong fixing qualities, and when the discovery of photography came, as it did later, this scientist remembered his successful experience, and happily applied it to the new science.

The professor gave some valuable hints in regard to the details of photographing, the fruits of a long experience and practice during his professional career. He deprecated the practice of washing the print free from nitrate of silver before toning, but advised thorough washing out of silver nitrate before fixing. To incomplete washing before fixing

were due many of the failures of printing, and especially was it detrimental to pictures in which the vignette is attempted, producing a yellow or faded appearance around the edges. The lecturer commended sodium sulphite as a most valuable agent in intensification, and recommended it for that purpose before all other preparations. He also approved the familiar process of the alum bath, and advised the artists present never to employ other agent than their fingers in the process of cleansing the surface of plates. There is a sensitiveness, he said, in the fingers which is most advantageous in the treatment of delicate films on plates.

Professor Franklin W. Hooper supplemented the scientific interest contributed by the Columbia scientist in a very remarkable exhibition of colored lantern slides. These slides had been colored by a young friend of the professor's, and the process, so far as he knew, was an absolute secret. When shown on the screen by the lantern their effect was most beautiful, and displayed remarkable genius in the young artist. The notable and unique fact in regard to colored lantern slides is that the colors employed must have perfectly transparent qualities and be impervious to the heat of the lantern. These two requisites have heretofore prevented much success in the colored slides, but Professor Hooper's *protégé* appears to have complied with them in a most satisfactory manner. The views shown were the same which embellished Dr. Hall's botanical lecture on the Kew Gardens, and, in addition, some beautiful scenes of glacial Norway. In these latter the professor called attention to the fine tinting of the ice, and pronounced the coloring of the highest order.

The very finest exhibition of the evening was that of the collection of Horace W. Gridley, of the London Camera Club. They were, for the most, landscape studies, and were probably the finest collection ever shown on the screen of the Institute. Mr. Gridley has an international photographic reputation, and has taken more medals and prizes than any other amateur photographer. The subjects of his skillful camera were as well chosen as they were finely executed. The magnificent and mediæval scenery of the Valley of the Rhone was the subject of many of the artist's labors. A perfect wealth of stately castles and picturesque hamlet scenery was shown, and some beautiful scenes on Lake Geneva and Lake Lucerne. The toning in these pictures cannot be described, and was

fully equal to the warm living colors we see in oils and water colors of a high order. There were also in Mr. Gridley's collection some Italian gems of architecture, among which were the Piazza Vittoria, the famous Duomo and the beautiful Campanile. The tone and shading in all of these were wonderful in delicacy, and bespoke rare talents in the gifted author. Mr. Gridley's productions were exhibited and explained by President Black.

The session was followed by a general exhibit of the recent work of the industrious members.

Preparations for the organization of an amateur class under Dr. Meeker are being made.

PEEKSKILL CAMERA CLUB.

THIS Club, which was organized in September, 1889, has just held its first competitive exhibition of photographs.

The display was opened to the public on Monday, March 17th, and was continued afternoons and evenings throughout the entire week.

Diplomas were awarded in seven classes as follows, three specimens being necessary to win in each class: Landscapes, Mr. Fred H. Southard; portraits, Mrs. P. H. Mason; interiors, Miss Robertson; flash-light, Mrs. P. H. Mason; snap-shots, Mr. Asbury Barker; outdoor groups, Mr. Harry B. Miller; transparencies, Mrs. J. D. Price.

In the class for special work a diploma was awarded to Mr. D. C. Hasbrouck. In the landscape class Mr. Arthur J. Birdsey received special mention as having the best single specimen.

The judges, whose decisions gave universal satisfaction, were Arthur H. Elliott, Ph.D., of the BULLETIN, and Mr. Frank Anderson, Peekskill's well-known artist.

On Tuesday evening, March 18, the competitive exhibition of lantern slides was held, and the diploma for the best three awarded to Dr. E. D. Fuller, Jr., the judges being Messrs. Anderson and Townsend. The entries in this class were numerous and displayed some of the best work of the Club.

The exhibition was one of which the Club may well be proud, ninety-eight frames receiving places in the hall, and the total number of photographs reaching three hundred and fifty-five.

This was greatly in excess of the expectations of the most enthusiastic members, and gave every one cause for congratulation—Dr. Elliott's remark that "the exhibit was better

than the first one of the New York Society with a membership of 300" being fully appreciated.

Among the photographs there was an endless variety of artistic landscapes, well posed groups and excellent portraits. In most cases the subjects were well handled and the technical work was good, the flash-light specimens deserving special praise.

The Club consists of twenty-six members, and is ably and efficiently officered, P. H. Mason, M.D., being President., Mr. H. Southard, Vice-President, and Mr. E. F. Hill, Secretary and Treasurer. Meetings are held at the Club rooms on Friday evenings, when instruction in the different processes of the art is made the order of the hour.

The Club has every prospect for a brilliant future, and will be heard from again.

ROCHESTER CAMERA CLUB.

FEBRUARY 21, 1890.—At the regular meeting of this date the Room Committee reported their work complete, ready for the formal opening. On motion the thanks of the Club were tendered to the Room Committee and to the Chairman, *President* CROUGHTON, in particular, for the admirable way they had performed the work of fitting up the rooms. Frank W. Kondolf was elected to membership. The demonstration of the evening was instruction in the operation of the enlarging camera by our President.

MARCH 7, 1890.—After the regular routine of business, the Prize Committee, having charge of the "Gundlach Lens," reported that the entries closed March 1st, and the allotment of time for use of lens would take place at close of meeting.

The Treasurer reported balance on hand \$115. Mr. W. Gaylord Mitchell was elected to membership. A committee of three was appointed to submit articles at the next meeting with a view of incorporating the Club.

Instruction in the use of the reducing camera was given by the President.

The following members were allotted time for use of Prize Lens: Messrs. John and Fred Hovey, Horne, Kerrigan, Mathews, Bicknell, Clackner, Willard, Gove, Haskins, Miller, Wilburn, Townley, Mawdsley and Moore. Each was given three days in either March or April, and four days in May or June, for use of same.

MARCH 14, 1890. FORMAL OPENING.—The new rooms were thronged from 7.30 to 11 P.M., by the members and friends of the Club, and

all seemed to have an enjoyable time. The session room had been turned into a veritable art gallery, almost every inch of the four walls being covered by photographs and bromides made by the members. The center table was piled up with loose photographs, albums and stereoscopic views, while hanging from the gas fixture were three transparencies, the work of Mr. W. J. C. Bicknell, which were the admiration of all. The largest, an 8 x 10, of the Genesee Lower Falls, was donated to the Club.

On entering the room a large frame containing over twenty 6½ x 8½ photos, the work of W. A. Page, is first seen. Two 16 x 20 photographs, donated by Hovey Brothers, the work of G. M. Elton, of Palmyra, were worthy of notice. One, "Bones," was a boy in a two-wheeled cart, drawn by a large black dog, who seems to be looking for bones. The other, "Aint We Daisies," was a group of six children in a field of daisies. Mr. Peter Mawdsley exhibited three large frames of pictures. Two of these were of silver prints mounted in optical contact with glass, and were gems. J. Edward Line and George W. Rafter showed a collection of seven bromides, of views at Hemlock Lake.

One frame contained views of W. J. C. Bicknell, W. G. Mitchell, John and Fred Hovey, G. H. Croughton and others. Mr. Willis Love exhibited "The Hermit," a beautiful study. Mr. E. W. Horne, A. S. Clackner and Henry W. Mathews each exhibited frames of pictures. Two bromides, donated by S. H. Lowe and G. R. Adams, and photos donated by P. W. C. Barry and T. B. Wilburn, Jr., occupied one side of the room. *President* CROUGHTON's studio was also opened for the evening, and the public had an opportunity of seeing the work of the leading portrait artist of our city. In an adjoining room a lantern slide exhibition was given, all slides being by members. As one of our morning papers puts it, "The Camera Club is constantly gaining in strength and efficiency." GUILFORD R. ADAMS,

Assistant Secretary.

PROVIDENCE CAMERA CLUB.

At the annual meeting of the Providence Camera Club, held March 1st, the following officers were elected for the ensuing year: *President*, R. Clinton Fuller; *Vice-President*, L. L. Anderström; *Recording Secretary*, Charles A. Stoddard; *Corresponding Secretary*, J. Eliot Davison; *Treasurer*, Arthur B. Ladd; *Librarian*, William A. Chandler. An

Executive Committee, consisting of the President, Secretaries, and Treasurer *ex-officio*, and five members elected from the Club—Henry J. Reynolds, Joseph A. Miller, Jr., William L. Coop, L. L. Anderström, Henry H. Davison.

The Club has made good progress during the past year. There has been a steady gain in membership and finances. The Club rooms are gradually being fitted with apparatus; the principal piece acquired during the past year is a "Boston Ideal" dissolving lantern. The facilities now offered by the Club are attracting members who are actively interested in photographic work. The New England Lantern Slide Exchange is proving very satisfactory, not only giving slide makers the opportunity of seeing other workers' productions, but the exhibitions are popular with the members' friends, who usually fill the Club rooms on lantern slide nights.

Hereafter the Club rooms will be open every Tuesday and Saturday evening (holidays excepted), with one or more members of the Executive Committee in attendance.

The Sixth Annual Exhibition by the Club will be given in May.

THE CALIFORNIA CAMERA CLUB.

THE California Camera Club held its second meeting March 24th, at the rooms of the State Board of Horticulture. A large number of gentlemen, amateurs and professionals, were in attendance and displayed a spirit of enthusiasm that insures a strong and active association. The officers of the Club for the ensuing year were elected, the honors falling to the following named gentlemen: G. W. Reed, *President*; Sanford Robinson, *First Vice-President*; A. P. Flaglor, *Second Vice-President*; T. P. Andrews, *Secretary*; W. N. McCarthy, *Corresponding Secretary*; E. J. Molera, *Treasurer*; E. P. Gray, *Librarian*; *Directors*—Theodore C. Marceau, I. E. Thayer, C. J. Wetmore and H. C. Tibbits. The new officials were installed at once. A vote of thanks was extended to the temporary officers, after which the roll was opened and in a short time sixty-five names were obtained for the charter list.

Acting upon the motion of E. C. C. Clement, the rules were suspended for the purpose of electing the first lady applicant, Miss Alice Cherry. She received the unanimous vote of the assemblage, and her election was heralded with intense applause.

A committee, composed of W. N. McCarthy,

W. B. Tyler and T. P. Andrews, were designated to procure suitable headquarters for the Club, and A. P. Flaglor, Theodore C. Marceau and F. P. Gray were indicated as a committee to procure the reading of papers on photography and other entertainment at the meetings.

By direction of the Club, President Reed will at once proceed to have it incorporated under the laws of the State relating to social clubs.

W. N. MCCARTHY,

Corresponding Secretary.

THE SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

THE sixth annual meeting was held on Tuesday, April 8th, at the rooms, 122 West 36th street, *President* C. W. CANFIELD in the chair.

Despite the inclement weather there was a large attendance, quite a considerable proportion being ladies. The meeting was called together about 8.10 P.M. and the reports of officers taken.

President Canfield gave a short summary of the principal features of the past year, dealing especially with the reserve fund and with the library. This latter, he stated, was now in fair condition, and donations of back numbers of periodicals will be gladly received. In concluding, he thanked the members most heartily for the cordial assistance extended to him during his two years of presidency, and trusted that they would assist his successor in a similar manner.

The *Treasurer*, in presenting his report, stated that the Society had a balance of \$920 in the reserve fund, and of \$21.92 in cash.

In submitting the *Secretary's* report, Mr. Beach gave an outline of the whole year's work. This showed that the Society worked in a thoroughly practical manner, there being seventeen lantern slide exhibitions, twelve special scientific exhibitions and two smoking concerts. In addition, entertainments have been given in Chickering Hall, and to the Press and other Clubs, all of which have proved highly successful.

The members' roll consisted of 120 active, 12 subscription, 49 corresponding and 13 honorary members. The proposed exhibition of the Boston, Philadelphia and New York Societies has been postponed until next spring.

In conclusion, Mr. Beach urged the members to increased efforts, and pointed out the desirability of the commencing of a photo-

graphic survey of New York and the surrounding district.

The election of new officers was then proceeded with, and the following were nominated and unanimously elected: *President*, J. H. Stebbins, Jr.; *Vice-President*, A. L. Simpson; *Corresponding Secretary*, F. C. Beach; *Recording Secretary*, T. J. Burton; *Treasurer*, C. C. Rourage; *Directors*, F. Vilmar, E. Warrin, R. L. Bracklow, L. B. Schram, H. N. Tieman, R. A. B. Dayton, F. Ruppert, and J. V. Black.

The meeting considered certain changes in the constitution, and finally decided on the appointment of two secretaries, Mr. F. C. Beach being elected Corresponding Secretary.

The Society is about to remove to more commodious premises, at No. 12 West 31st street, and plans of the proposed rooms were exhibited and pronounced satisfactory.

Mr. A. P. Smith gave a demonstration of the working of positive films; Mr. F. C. Beach exhibited some English lenses and a shutter, and Mr. Colgate showed his new practically smokeless flash powder, along with several very successful portraits and interiors taken by its light. The meeting adjourned at 10.15 P. M.

KANSAS CITY CAMERA CLUB.

THE amateur photographers of Kansas City met at Messrs. Mullett Bros., 515 Walnut street, on the evening of March 29th, and organized the above club. A Constitution and By-Laws were adopted, and the third Saturday of each month was fixed upon as the time for holding regular meetings. The following officers were elected: *President*—G. W. Pearson; *Vice-President*—W. W. Cloon; *Secretary*—Charles A. Young; *Treasurer*—W. H. Perine; *Executive Committee*—George Curtis, Theodore Stanley, E. H. Allcutt.

Those present at the meeting, in addition to the officers and members of the Executive Committee, were L. H. Sears, G. M. Gould, Charles Humphries, Charles Stadler, Fred. Mullett, R. B. Mullett, C. A. Whitaker, Walter M. Ford.

CASE SCHOOL CAMERA CLUB.

At the meeting of the Club, held Friday afternoon, March 21st, President Rynard and Secretary Williams were, on motion of Professor Smith, appointed a committee to divide the city and vicinity into sections and name two members for each section, with instruc-

tions to "take" such objects as they think of interest, and then a general exchange of negatives to take place as the result. At the close of the meeting Messrs. Rynard and Marshall made a flash-light exposure on a few of the members, and developed it with eikonogen.

MILTON B. PUNNETT,
Corresponding Secretary.

LYNN CAMERA CLUB.

LANTERN EXHIBITION AND LECTURE, BY W. GARRISON REED, MARCH 19TH.

THE clerk of the weather seems to have laid up a special grudge against the Camera Club, for ever since they have occupied their beautiful new club house, from the night of the dedication up to last night's exhibition and lecture, it has stormed on every entertainment night.

Those who did brave the storm were amply repaid by the excellent lecture delivered by Mr. William Garrison Reed, of the Boston Camera Club, on the Battlefields of Gettysburg, Antietam and the Shenandoah Valley, which was very finely illustrated by fifty-five views, taken by himself on the spot in the summer of 1886. Like all of the views which have been shown at the Camera Club rooms, they were very clear and distinct, giving the audience about as good an idea of the localities visited by the lecturer as if they had been with him and were looking, not upon a canvas screen, but upon the real scenes. The most realistic view shown was the Winchester turnpike, over which Sheridan made his famous ride, which has been immortalized by Thomas Buchanan Read, in his poem familiar to every schoolboy. The view showed the famous pike as it stretched up to the top of the hill, and as the picture was shown the lecturer read these lines from the poem:

"But there is a road from Winchester town,
A good, broad highway leading down;
And there, through the flash of the morning light,
A steed as black as the steeds of night
Was seen to pass as with eagle flight."

You could imagine the horse and his gallant rider coming into view over the crest of the hill. Many a heart was thrilled as they gazed upon the view, and it softly dissolved, leaving Sheridan himself on his "coal-black" steed all covered with dust and white foam as he drove up to his retreating army and soon turned defeat into victory. It was a very fine and effective scene and brought forth much applause. One very noticeable

thing about the lecture was the taking up of many new scenes and instances which have been forgotten, and although we have read and seen a great deal about the famous battle-grounds, it was made as interesting as if we had never before heard of them.

Mr. Reed is to be congratulated upon securing so many interesting scenes and incidents upon a subject which one would naturally think was worn threadbare. The lecture was very carefully prepared and showed a great deal of thought in its preparation, and was well delivered. The lantern was managed by the President of the Club, Mr. Drew, and the slides were handled by the Treasurer, E. F. Bacheller.

(To be continued.)

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—R. C. M. sends platinum prints and writes: I can't find any one in town who knows anything about platinum prints. I am anxious to know how these samples sent herewith compare with the possibilities? I don't like the color, the whites are too brown, and the blacks are not black enough. The negatives are first-class ones, with the shadows clear glass, and make excellent silver prints. The paper used was that sold in packets for cold development in acidulated water.

A.—The blacks of the prints are a little light colored, and the whites are too dark as you say, that is, compared with what can be done with this kind of paper. We should say that the paper was too old to give first-class results; but the use of a little more strong hydrochloric acid in the bath and good washing will improve the quality.

Q.—C. S. B. writes: Will you please answer through the BULLETIN these questions: 1st, do you think that nitrate of ammonia is beneficial in the printing bath? 2. If it is how much should be used? And does it diminish in strength as fast as the silver, and should it be added as often as you add silver, or do you know of anything better to use in its place?

A.—Ammonium nitrate is sometimes used in neutral silver bath to assist in the coagulation of the albumen paper. It should be added in amount equal to the silver nitrate used. It does not diminish as fast as the silver, and should only be added in cases where the bath shows a tendency to become cloudy from separation of a silver precipitate which the ammonium nitrate will dissolve.

Q.—H. H. H. sends several prints of cabinet portraits, and writes: I have a 3-A Dalmeyer lens, which I got second hand, apparently new, and I have considerable fault to find with it. The pictures I send seem flat. It is hard to get a focus. All pictures appear to be the same. I have a shutter at the back of lens, the opening in which is a little too small for the lens. The shutter may cause the trouble some, but I notice no difference, although it has been mounted this way with shutter for about four years. Inclosed find three proofs, two are made with No. 3 Stop; the one with two children without any stop. Which seems to be the best? Please state where I can have the lens examined.

A.—The portraits are sharp enough. If you want more contrast modify your lighting. Focus with No. 3 Stop. The shutter should give full opening of the lens. Our publishers will test the lens for you if you send it.

Q.—S. S. W. writes: I see by your last issue a question is asked what causes those dark spots. I had them twice; I call them black measles; they come from having your silver too strong. Twice I have weakened my bath and they disappeared: once when my old bath was 70, and once on a new bath a little over 60. I am trying to make aristotypes and don't get tones to suit me. Will some one send me a practical formula?

A.—We are glad to hear of the method of our friend, and hope some of the readers of the BULLETIN will try it. In regard to the toning of aristotypes, see the articles of P. C. Duchochois in the BULLETIN.

Q.—C. P. writes: In the next issue of the BULLETIN kindly give me some formula for a good dead black varnish for photo-zinco-graphic purposes.

A.—Use good lithographic ink thinned to suit with turpentine. If you wish to have it dry quickly, add a little medium varnish.

Q.—D. H. H. writes: What quantity of flash powder or magnesium, as the case may be, is required to be burned to light up the Statue of Liberty in New York Bay to make a 5 x 8 view of the same?

A.—The quantity used has escaped our memory. Write to Mr. S. R. Stoddard, Glens Falls, New York. He will probably help you out.

Q.—W. B. C. writes: Will you kindly answer through the BULLETIN the following: I prepared a silver sensitizing bath as follows: Silver nitrate to mark 60 grains to ounce; citric acid, saturated solution, 10 drops. Dissolved silver citrate in nitric acid c. p., then added sodium carbonate till neutral. Paper silvered on this bath will keep for a long time. What troubles me is to get the bath neutral? When I add soda enough to react on the acid it then forms a precipitate which I think is carbonate of silver. Now, would the keeping quality of the paper be as good if I should use ammonia? And does this precipitate caused by soda carbonate hurt the bath, and is it a waste of silver to filter it out to clear up the bath? What is the best alloy to make chloride of gold with?

A.—If you precipitate your bath with sodium carbonate and filter you waste silver as carbonate. We should think you could use ammonia. Try it on a small portion of the bath and with a small piece of albumen paper. Use U. S. gold coin for gold chloride, or, if you can get it, what is called fine gold 24 karats.

THERE is something about photographs made by a person possessed of regular art training that gives to them an artistic value, and this fact is so evident and prevailing that it has forced itself directly against the well-known prejudice of artists so strongly that there are now but few painters and illustrators, even of the highest rank, that do not recognize it.—*F. A. Hetherington.*

Views Caught with the Drop Shutter.

MR. J. E. RAMSEY, for the past ten years the secretary of the Morse Engraving Company, and for three years previous with the Photo-Engraving Company of this city, has just organized the RAMSEY ENGRAVING COMPANY, for the manufacture of photo-engraved relief plates in both line and half-tone work. Mr. Ramsey is President of the Company, and their office is 252 Broadway, New York City.

WE are glad to hear that the house of W. D. GATCHEL, of Louisville, Ky., escaped the terrible cyclone that swept through that city, and that they are at work as usual.

MESSRS. WILLIAMS, BROWN & EARLE, of Philadelphia, send us two excellent flash-light pictures made with the Pine Flash Lamp, using the Cramer forty plates, Beck lens, and 12 grains of pure magnesium. The depth of view is 18 feet, and the prints show a remarkably good definition. They are certainly among the best we have seen.

WE regret to note the death of Mr. E. W. BOGARDUS, one of the well-known photographers of New York. He died at his home at Nyack, N. Y., on April 3d.

DR. C. E. OLMSTEAD, of Syracuse, N. Y., has a manual of photography for sale, containing a description of the daguerreotype process and published in 1845. Also, "A Guide to Painting Photographic Portraits," by A. N. Rintoul, published in 1855. If any of our readers need them they should write Dr. Olmstead, at above address.

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Contentment.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

APRIL 26, 1890.

Vol. XXI.—No. 8.

ALBUMEN PAPER AND THE TARIFF.

It is not often that any action taken by Congress produces an effect upon the monotonous course of events that make up the life of the average photographer. But the proposed increase of twenty per cent. on albumen paper is likely to set many thousands of the fraternity thinking.

When one thinks how much the character of the work of the photographer depends upon the paper he uses, it is not at all surprising that there is a general uprising against this increase of tariff upon albumen paper. After producing a good negative, the success of the finished picture depends upon the albumen paper, and a vast amount of labor may be expended to an entirely unprofitable end if this paper is not just what it should be. No matter how carefully the silver bath is made; no matter how carefully the paper is floated, dried, fumed and printed; no matter how carefully the print is toned and fixed; no matter how skillfully it is mounted and burnished, if the albumen paper upon which all this work is expended is of a poor quality, the picture will be poor and command a corresponding rate of remuneration for him who made it.

It is therefore evident that to obtain good photographs the photographer must have good albumen paper. Following this the question naturally arises: What is good albumen paper? The answer comes back from the thousands of working American photographers, whose pictures are unexcelled in the civilized world: they use imported albumen paper in proportion of four to one of domestic paper, and this in spite of its higher price in the market. It is evident from these facts that American albumen paper does not meet with general approval at the hands of American photographers.

The superior quality of the imported paper is largely due to a combination of circumstances in Europe which does not obtain here. In the first place, there is no paper made in the United States the stock of which is purified carefully enough to serve as a basis for albumenizing. The paper made at Rives, in France, and used as a basis for albumen paper, is made with probably the purest natural water in the world, the result of the melting of the Alpine snows. This paper is used by the Dresden albumenizers, and the makers are under contract with the Dresden factories to furnish them with their entire output. This entirely excludes the possibility of selling to English or American manufacturers who may wish to albumenize this paper. An inferior quality of paper is not wanted by American photographers.

The second reason for the superior quality of the imported albumen paper is the care with which it is made by hands skilled through years of practice in its

manufacture. In the United States, if the labor that is put upon the manufacture of albumen paper at Dresden should be used, there would be absolutely a loss in its production, that kind of labor costing so much more here than in Europe.

Furthermore, is it fair and just that American photographers should be taxed \$6 per ream more on the albumen paper that they use, in order to enable a few American manufacturers to educate themselves and their employees in the manufacture? Let American manufacturers make as good paper as the imported article and they will find a ready market for it, and under the present tariff law they would have a profit of fifteen per cent. The trouble is that work of this character which is done in Europe slowly and well, is too often executed with the rapidity characteristic of our life and with its incidental imperfections. It happens that American photographers prefer a good albumen paper to work with, and if American manufacturers cannot produce it with a tariff of fifteen per cent., they are unusually careless investors of capital.

Mr. J. M. Appleton, the President of the Photographers' Association of America, has issued a petition which says :

It would benefit a very large class of persons if the duty were removed altogether, but if this cannot be done we certainly can see no reason for increasing the duty beyond fifteen per cent. If American albumenizers cannot produce a satisfactory article at that amount of protection they cannot do so at thirty-five per cent.

All the persons called upon for information and expressions of opinion on this matter, whether importers of albumenized paper or its consumers, the photographers, agree in their testimony as to these points.

First.—American manufacturers, no matter what protection the tariff may afford them, cannot produce the albumenized paper required in fine photographic work.

Second.—Importers would be obliged by the proposed increase of the tariff to add \$6 a ream to the price of the paper.

Third.—Photographers, owing to the competition in their business, would be unable to transfer the tax to their customers. They would have to pay \$6 a ream more for their material and furnish photographs at the same price as before.

"This increase will take at least \$100,000 annually from the pockets of photographers throughout the country and increase the surplus in the Treasury by that amount without benefiting any one."

If each photographer will now make this matter a personal one, we think there will be no disturbance of the present arrangements. Each should write a letter to the member of Congress from his district stating the facts of the case. Each should call attention to the low margin of profit now obtained by the majority of photographers, and the keenness of the competition in the profession. We are sure that if every one will do this, the cruel advance which benefits so few and injures so many, will be omitted. If you value your work, stand together, and act at once.

EDITORIAL NOTES.

BEFORE photography becomes as popular in this country as it seems likely to do in Japan, there appears to be a field for missionary work on somebody's part in the way of lobbying it into the public schools *via* Congress, as the Japanese have done, a bill having passed their government making it one of the required courses of study in all the high schools of Japan for the coming half year.

WE note from our exchanges that Mr. William H. Rau, of Philadelphia, has recently completed a most interesting set of negatives of the University of Pennsylvania, intended to illustrate an elaborate report which is to be published by the Bureau of Education at Washington. The views include the principal departments of the University, and embrace some subjects which have never heretofore been successfully photographed. This work will be of especial interest to the alumni and to all good friends of the University.

WE have received from Mr. William Dougall, of Invercargill, New Zealand, who claims to be, and probably is, the photographer nearest to the South Pole, a most entertaining collection of views of that country, which are of first-class quality from a photographic standpoint, and those of the hot spring and geyser regions are extremely interesting and beautiful, surpassing in the latter quality those of the celebrated hot springs of the United States in the Yellowstone region. The wonderful terrace formation that is characteristic of the Yellowstone section, is here repeated in even more fantastic and beautiful forms. We tender our best thanks to our good friend for so kindly thinking of us.

WE are also indebted to Mr. J. Manrico R. Valente, of Oporto, Portugal, for a charming set of views of Portuguese scenery and groups of native children. Mr. Valente has exercised good judgment and excellent taste in his selection of subjects, and the results are very pleasing in all ways.

IN our advertising columns we notice a statement to the effect that Rockwood, so long established on Union Square, "is going up higher." We presume that he finds his real estate in the upper part of the city requires him to be nearer to it and he purposes taking his business with him. None the less, it leaves a well-known corner in the market for some enterprising concern.

LAST week it gave us pleasure to note a matter of photo-historical interest to ourselves, and one which we think will be of equal pleasure to our readers, regarding Daguerre. On the occasion of a farewell dinner which was given to Colonel Gouraud, who was about to return to England, carrying with him General Sherman's reply to the speech of the "Grand Old Man," Gladstone, to bring which to this country, was one of the main objects of his coming, Colonel Gouraud took occasion to refer to photography, and stated that at the time of the discovery by Daguerre, he (Daguerre) and Colonel Gouraud's father were intimate business friends, the former in France and the latter in America; that Daguerre sent to the elder Gouraud the first instrument for making daguerreotypes which ever came to America, and the first picture ever made with the instrument, and consequently the first daguerreotype made in this country, was made by him, and the sitter was his wife and the mother of the speaker, who further stated that the picture was still in existence and naturally highly prized by his family.

WE gather from our English exchanges, that one of the prominent manufacturing concerns on the other side have discontinued the offering of "trade medals" for certain kinds of work, and in place of the former custom have decided to devote the money to the forming of a photographic scholarship, of the value of £100 a

year, tenable for three years. There would seem to be excellent opportunity for their example to be followed here by American manufacturers.

MR. R. D. CLEVELAND, of Minneapolis, sends us a series of very interesting photographs in different colors, a warm sepia and a bluish black, which are printed on rough charcoal paper, and which, showing the grain and tone of the paper beneath the print, gives a delightfully artistic effect to the work.

WE are the recipients of three large photo-gravures made by the Empire Photo-gravure Company, two of them illustrating Tennyson's Idyls of the King, after the work of Alfred Fredericks—one, representing Elaine gazing after Lancelot after he has left behind him his shield; the other, depicting Guinevere at Almesbury. These reproductions are each 18 x 33 inches in size of work without margins, and when considered in conjunction with another, 17 x 30 inches, representing two fisher-girls sitting on the beach, which is a copy of Delobbe's "Two Daughters of the Sea," we consider a remarkable collection of reproductive work. The tones and half tones are retained with great fidelity, and we are glad to put on record our belief, that the quality of this work is unsurpassed in this country. We consider the production of such plates as these, both in quality and size, an honor to American workers in photo-mechanical processes.

La Nature contains copies of two instantaneous photographs illustrating the difference between a volley fired with ordinary powder and with smokeless powder. The pictures were taken at the moment when the commander gave the order "Fire." In the first a thick black cloud of smoke is represented, through which the gunners are barely perceptible. In the second photograph, only a thin haze is observable, which evidently would totally disappear in a second or two, and which probably would not be seen at all from a short distance. The gunners stand out in the background clearly and sharply defined.

A MOST interesting lecture was given by Dr. Ward before the Dana Historical Society of Albany, on the 14th inst., on the subject of "Photography," in which each process was lucidly explained, and following which an entertaining selection of slides were exhibited by Mr. Byington, mostly from negatives made by members of the Albany Camera Club.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Formaldehyde, a New Body.—The Acid Hypo Bath and its Action.—The Concentrated Hyaroquinone Developer.—About the Qualities of Lenses.—Bierstadt's System of Orthochromatic Photography.

WHAT is the latest novelty in photography? Answer: Formaldehyde and bi-sulphite of formaldehyde and sodium. This substance is not quite new, but it seems that its alleged favorable photographic properties have only recently been discovered. What are its properties? According to the assertion of the inventors, York Schwartz and Dr. Merklein, its value is proven particularly in connexion with carbonated alkalies, as an addition to the ripening of gelatine emulsion; the ripening process is accelerated by imparting strength and clear-

ness to the negative as well as to the developer, no matter whether the latter consists of ferrous oxalate, pyro or hydroquinone, the oxymethyl-sulphonate of soda, on account of its oxygen absorbing power acting not only as a preservative but also as accelerating the development and preventing fog.

The same compound, although less intense, will act in a strongly diluted solution in the presence of carbonated alkali or ammonia, as preliminary bath for exposed plates before development.

If the alkali solution is used in such a manner that dry plates can be bathed in the same and exposed after drying, similar action will be obtained as if the above-mentioned compound had been added to the emulsion before ripening.

The sensitizing action of the formaldehyde and its compounds rests, undoubtedly, upon the energy with which these bodies absorb bromine or iodine, or transfer the same.

This new body has still another property. It is patented in all countries. I have examined this preparation, which, under No. I, as a white salt, and, under No. II, as a violet substance, has been introduced into the market, in the developer, but have found only that it acts as an anti-fog, and retards the development considerably.

A more detailed test was made by Dr. Eder. He found, with an emulsion prepared by himself, that the developer would produce two numbers of Warnerke more than any ordinary developer; but he adds, that not all tests showed the same favorable results regarding an increase of the sensitiveness by application of preparation No. I in the developer, so that it is questionable whether a practical advantage can be obtained by introducing this preparation into the ordinary pyro developer.

Eder tried further a solution of this salt in water (1.1000 to 1.2000) as preliminary bath for bromide of silver gelatine plates after exposure and before development.

This preliminary bath, applied for about half a minute, has the effect that the plate develops quicker and more powerfully in the oxalate of iron developer, and produces more details in the shadows with under-exposed plates.

But it is advisable to wash the plate before placing it in the oxalate developer to avoid fog. This preliminary bath acts in general the same as the ordinary bath of hypo under the same conditions. A preliminary bath can, therefore, be made cheaper with hypo.

Dr. Eder tried finally also the addition to the emulsion.

In the production of ammonia oxide of silver, the formaldehyde mixture (II) was added to the bromide-gelatine solution before mixture with the silver solution and digested for half an hour; for parallel tests an analogous emulsion without this addition was produced.

The tests with both emulsions proved that the addition of formaldehyde mixture had not lessened the time of ripening very materially, but had acted as an anti-fog in the emulsion. A visible increase of sensitiveness by this addition was not observed, and with one test (digestion of half an hour) even a reduction of the sensitiveness in comparison with the ordinary emulsion took place.

The reader may judge from the foregoing as to the value of the preparation.

I wrote to you already some time ago about the acid fixing bath, which is obtained by adding to a liter of fixing soda 1 : 4, 50 cubic centimeters and acid sulphite lye, which can be bought here in market. Such a fixing bath keeps

particularly all negatives developed with pyro very clear, and prevents yellow coloration.

Lainer recommends now such an acid hypo bath for the reduction of negatives.

Lainer applied in his experiments a sulphite solution acidified with muriatic acid (250 grams sulphite of soda, 1 liter water, 70 c.c. muriatic acid; the sulphite of soda must be completely dissolved), but other acid sulphite solutions may also be applied.

The reduction is accelerated and passes off very good if a slight trace of red prussiate of potassium is added. This reducing solution will not keep, but can be made active again by a renewed addition of red prussiate of potassium.

The strong acid fixing bath has a considerable reducing effect upon already toned and fixed albumen points, aristotypes, etc., under prolonged action, whereby the tone of the pictures suffers also a change.

Another not unimportant observation was made by Lainer, with regard to the old and already used acid fixing baths, which were preserved at the Imperial Institute to regain the silver.

The neutral old fixing baths decompose with separation of very finely divided sulphide of silver, which even after months will not precipitate, not even when precipitated with sulphide of potassium, whereby a loss will be the result, as in practical life decantation is generally adopted in preference to filtration.

The old acid fixing bath remains completely clear, and the precipitation can proceed after the known methods, or after the new method by precipitating with reducing salts, the precipitate falling completely to the bottom, after which the clear liquid can be decanted without loss of silver.

Last year the question was asked through the "Mittheilungen" in what manner plates, intensified with mercury, which in consequence of bad washing after fixing had become brown, could be restored. The answer was, that no satisfactory remedy was known.

Lainer recommends for the removal of this brown coloration likewise the strong acid fixing bath (equal parts of acid sulphite solution and fixing salts solution). In some experiments that took place the brown spots, as well as most of the white glittering parts, were completely removed after one half to two hours, notwithstanding that strong colorations and spots had intentionally been produced.

Lainer browned also gelatine negatives with nitrate of silver and by subsequent exposure, as sometimes takes place in printing with albumen paper which is not thoroughly dry, and here the defect was also removed by the strong acid fixing bath, provided that the nitrate of silver had not already penetrated too deep.

From the United States I received the following questions, and I expect that, with the answers thereto, they will be of interest to the brotherhood. They are the following: "Formula of the so-called concentrated hydroquinone developer," for which I was requested:

Sulphite of soda crystallized.....	40 grm.
Hydroquinone	5 "
Carbonate of potassium.....	50 "
Distilled water.....	150 cc.

This mixture will keep for months. For use 5 cc. to 30-40 cc. It is to be remarked that this developer is calculated only for correctly exposed (not over-

exposed) plates. For over-exposed plates I take the developer which has already been used once or twice, and which I preserve for that purpose.

Here is an optical question: "All photographic objectives of equal rapidity, according to Dr. Miethe, have equal depth of delineation, and the difference in the construction is of no influence (the latter qualifying only correct delineation, size of picture field and accuracy of the same.) Therefore, the depth of the pantoscope could be produced in a rapid objective 1 : 4 by corresponding reduction of the diaphragm? (Certainly; the condition is only that you apply actually the correspondingly corrected diaphragm opening). Can this rule also be applied to single landscape objectives? (Yes, if they are well constructed.)"

Steinheil's catalogue says: Portrait antipianats whose rapidity is equal to that of portrait objectives with considerable depth. Are antipianats an exception to the above? (No.)

An objective of 73.6 cm. focus is to reproduce an object of the same size as one of 18.4 cm. focus; the distance of the former is therefore four times greater. Will the pictures differ in depth and sharpness? If both objectives belong to the same system (equal picture-angle and rapidity), and if both pictures have been made with equal light strength (corresponding diaphragms), the following is observed:

The picture field of the objective with long focus is decidedly more flat (less rounded) than the one with short focus; the sharpness—under equal circumstances—will extend more towards the edges in the former.

In the *American Annual* I find an article by Mr. Bierstadt about orthochromatic photography with ordinary plates. Mr. Bierstadt's view is that ordinary plates have also a small yellow and red sensitiveness, which of course appears only at very long exposure. To make use of this yellow sensitiveness for colored objects, Bierstadt repeats the already known proposition to subdue the blue light, for which the plates are principally sensitive, by a yellow screen. This is nothing new. He recommends now as yellow screen, aniline yellow and eosin* in a glass trough with two polished glass plates. In place of this I recommended formerly a plate glass coated with aurantia collodion, which, at all events, is much simpler than a glass trough with two glasses and the liquid therein. It is pretty difficult to procure one glass plate thoroughly even. It is not many years ago that absolutely even glass plates could not be procured in New York, London or Vienna, and that such could be obtained only in Berlin.

But what does Mr. Bierstadt expect to attain with his glass trough filled with yellow solution? He gives the answer himself by his prescription to expose two hundred times longer than without yellow screen. In comparison to this I would call attention to the fact that with the least color sensitive plates, that is, the old azaline plates, through a yellow screen twelve times as long an exposure is needed as with the ordinary plate.

With bath azaline plates only five times as long; with eoside of silver, through yellow screen, only three times as long; and without the yellow screen not longer than with the ordinary plate; it follows therefrom that eoside of silver plates are two hundred times more sensitive for yellow light than an ordinary plate with Bierstadt's yellow glass trough.

This proves sufficiently the eminent value of color sensitive plates.

* Why eosin? This reduces only the intensity of the yellow light. It acts favorably only on the bromide of silver films.

QUESTION BOX.

Does it Cost Much to Fit Up a Gallery?

BY G. H. LOOMIS.

FIGURATIVELY speaking, sometimes it does. And yet all you have to do primarily is to secure a loft, insert some side and sky lights, with a sufficiency of backgrounds, screens, reflectors and posing chairs, the number and kind of which will largely depend upon your ideas (if you have any) of what you want; and then you most likely will need several cameras and about half that number of camera stands, with a sufficiency of lenses to meet all possible requirements, and there are several of them. Then, besides a light room, you will most likely require a darker one, where you can retire from the observation of your sitters (if you have any), and attend to the "chemicalization" or the wetting of your dry plates, according to written, printed or guessed-at formulas. The number of bottles, trays and solution dishes generally will depend upon the capacity of your closet and pocketbook, the last mentioned convenience, in this as in other matters of supply, being more or less useful (oftener more than less).

Some shelving can be introduced, most of which should be in reach of the manipulator. Vessels containing adulterated solutions, like whisky, brandy and the like, should never be uncorked, except in the presence of discreet friends. It should be stated here that our best artists discard these altogether, no excitants being necessary in dry plate development. The doors to your dark room and plate-holders should never be opened when occupied, as foggy effects and profanity are often the consequence. I have said nothing about the necessity of an ample water supply. The more the better, if it is under reasonable control, or unless your sinks are leaky and the underneath tenant should happen to be a dealer in waterproof wear and withal a sweet-tempered Christian.

An overflowing aqua supply has often been attended with claims for damages, when the photographer intended no harm to the occupants next below him. Quality of the goods might remain the same, but discoloration and bad chemical effects injured the sale of the goods and alienated the affections of the owner.

Ground floors or sub-cellars, when easily to be gotten at and not too expensive, are safest for print-washings. You will need what is termed a printing-room, for, on the supposition you have any sitters, the light room will be occupied and the dark room not sufficiently luminous for the purpose, though, for retouching, the latter may be utilized, provided the operator or positionist is also the retouchist, and don't care about his environments. A matched board partition, however, will suggest itself, and we may say the same concerning the printing and toning apartments.

I will not dwell on rules or conveniences for toning, as every one has a formula of his own or somebody else's, and tones vary greatly. Unless you have gold or silver you will have to use substitutes or equivalents, and these are difficult to obtain, especially with new beginners, or even with old practitioners, whose balances with stock-dealers are on the wrong side. Of course, you can use the bromides and chlorides, if you have anything at hand to make them of. Many of our best artists use them altogether. And yet I may add that for want of them quite a number of those otherwise successful have had to retire. Even workers in carbon and platinum are no exceptions.

Mountings, potting and burnishing require a reasonable degree of care, but aside from the trifling cost of the burnisher, the necessary card mounts, a few brushes, a supply of starch soap and saliva, nothing expensive need be incurred.

We came very near forgetting to say that unless you are an amateur, and "working for the fun of it," you will most likely require a paying patronage—to obtain which some specimen work and a very large amount of patient waiting will be necessary. Only those are successful who succeed.

The reason why so many people are obliged to go out of the business is because so many go in, and not because the law of demand and supply is so different from other trades and professions.

ON THE DEVELOPMENT OF GELATINE DRY PLATES.

[From a Lecture before the Brooklyn Institute.]

BY HENRY J. NEWTON, *President Photographic Section American Institute.*

WHEN talking upon the subject of photography I always feel that I have brought my mental energies in contact with an immense subject. It is one of the three gigantic developments of the nineteenth century. The steam engine and the electric telegraph are its companions. However great the harvest which may be garnered as the fruit of this century, we will, no doubt, be justified in believing that, when compared with the undiscovered, it will prove ultimately to be but as a few drops of water compared to all the drops in all the seas and oceans, or as a few grains of sand compared to all the grains of sand on the shores of all the seas and all the oceans and in all the deserts.

Modern science, when rated by her achievements, is an infant; she is dwarfed and scared, the result of many a conflict and hard fought battle, with the odds fearfully against her. Through the centuries she has struggled, always on the defensive. In this respect, however, there has been a great change wrought. About fifty years ago science commenced an aggressive warfare on her ancient foes and she has made fearful havoc with the opponents of scientific methods of investigating nature and her laws; her baffled enemies are being driven from their boasted strongholds, disarmed and defenceless. Demonstrative facts are impregnable fortifications, and will stand unharmed the puny assaults of the bigot and dogmatist. The time is rapidly passing away that calls upon us to contract to believe to-morrow what we believe to-day. We expect and hope to know to-morrow more than we know to-day, and we deem it wrong to put obstacles in the way to the free and unobstructed access to the truths. To come in possession of truth is not so simple a matter as some are inclined to think; the more familiar we become with nature and her methods the more are we convinced that she holds her secrets with great tenacity, and that they cannot be forced from her by any Chinese method of warfare. The banging of gongs and exploding of crackers will not work in an attack on nature. We garner a little at a time, and that only by rational and persistent effort. Great discoveries have been made in this way; first the germ is discovered, then a multitude of minds commence working on the problems involved, and a little is contributed here and a little there, till a great and wonderful invention is in the possession of humanity, contributing to its comfort and happiness. In this way the science and art of photography, as we have it to-day, has been unfolded from the womb of nature, so it has been with the steam engine and with the electric telegraph.

A genius like Edison comes on the field of action and nature seems to yield up her treasures to him as if he was in possession of a magic key by which he gained access to her secret chambers and to some of her choicest gems.

In the development of photography there is an army of eminent names who have contributed, each one or more links in the wonderful chain which is the whole of this great discovery. The chemical and mechanical methods employed to render visible the latent and invisible image, concealed in an exposed sensitive plate, is called developing it, and it is with this, or that part which relates to the modern dry plate, that I have to do this evening.

To make plain the differences between the modern and antique methods, I will have to trace briefly the steps by which the methods now in vogue have been reached. The first dry plate was developed with a solution of nitrate of silver and tannin or gallic acid in water acidified with citric acid; afterwards pyrogallic acid was substituted for the tannin or gallic acid; this was the prevailing developer for dry plates for quite a number of years. The last one, and that still in use in many modified forms, is what is known as the alkaline developer, with the exception of the ferrous oxalate developer, which is practically an acid developer, although it can be used slightly alkaline by the addition of a chromic salt. The ferrous oxalate developer is not used extensively at the present time for the development of the gelatine dry plate.

The alkali employed for many years, and still adhered to by a few, was ammonia, either the liquid or the carbonate; this last is not, however, suitable for use in developing the gelatine dry plate.

Some ten or twelve years ago I introduced for the development of gelatine dry plates the carbonate of soda, and also the carbonate of potash without the use of any bromide salt. These carbonates could be used in combination, and for plates of some makers seemed to make an excellent developer; also the yellow prussiate of potash added strength to these carbonates when combined in small quantities, giving more density to the negative with less pyrogallic acid. The restraining action of the gelatine was sufficient to keep the negative clear without the use of any bromide salt. One-half grain of the bromide of sodium to the ounce of developer would necessitate double the exposure.

Of these two carbonates I recommend the carbonate of soda for two reasons: first, its action was less corrosive; second, the sufficient density could be obtained with half the quantity of pyrogallic acid. The quantity of either of these carbonates to the ounce of water had a very wide range. I have used from less than half a grain to the ounce to 70 grains to the ounce, the difference depending mainly upon the exposure of the sensitive plate. This may account in a measure for the fact that we have almost a limitless number of developers with these carbonates for the base; another cause is the existence in some natures of a weakness, an ambition to see their names in print and affixed to a formula for developing. These persons would have you think that some important discovery should be accredited to them because they compound the carbonate of soda or potash with a few grains more or a few grains less than somebody else has done, when, as a matter of fact, it would hardly be perceived without special attention being called to it, whether one of these developers contained 6 or 10 grains of either of the above-named salts.

Before the introduction of the sulphite of soda in conjunction with these developers, it was the custom to develop only one or two plates with the same

developer, fresh developer being prepared each time because of the rapid oxidation, but by the use of the sulphite of soda the rapid oxidation was prevented, and a large number of plates could be developed with the same developer, the action, however, of the developer becoming less energetic, having by repeated use collected a little of the gelatine from the plates, and also the bromide left free by a partial decomposition of the bromide of silver. A small quantity of fresh developer added to that in use would nearly restore its primitive action.

The use of the caustic alkalies as developing agents up to the time of the introduction of sulphite of soda and hydroquinone had not been successful, but with these two agents a wide field of experiment was opened, and in the "International Annual" of Anthony's Photographic BULLETIN for 1888 was published some of the results of my experiments up to that time with the caustic alkalies, and I will now give you some of the formulas which I can recommend as being capable of producing fine negatives in my hands. It does not follow, however, that because one person succeeds with a given formula as a developer, another will, as there is always something accompanying the use of a developer, a certain ingredient which has never been put in the written formula, viz., ingenuity. This cannot be weighed or measured, but is nevertheless absolutely essential for the successful working of any formula as a developer. I have known distinguished men, congressmen, editors, who could get up at a moment's notice and make an elegant *extempore* speech upon almost any subject, but could not, with the most perfect appliances in hand, make a good photographic negative.

The first formula will be with the use of caustic barium, which Dr. Elliott suggested my trying. This salt is sparingly soluble in water, and I would recommend that three ounces be put into five pints of water and shaken occasionally for a day or two, when it will all be dissolved, and will about saturate the five pints of water. There will, however, a flocculent mass settle on the bottom of the vessel, which will not dissolve. After standing a few days it will become perfectly clear and is then ready for use, or it can be filtered for instantaneous work; to 1 ounce of this solution add 30 grains of finely pulverized sulphite of soda. This produces immediate double decomposition, and you have formed the insoluble sulphite of barium and have liberated caustic soda. Into this put 3 grains of hydroquinone. As soon as this is dissolved it is ready for use. Although it has the appearance of milk it soon settles, or it can be filtered, but it is no better for being relieved of the barium sulphite.

This is a powerful developer and will keep indefinitely, and a large number of plates can be developed in the same developer. This can be made one-half or one-third strength for time exposures or for gallery work, and if it is not desirable to keep it, one-half or one-third of the sulphite only need be used.

My second formula will be with the caustic soda :

Caustic soda (95 per cent. pure).....	4 grains.
Sulphite of soda.....	30 "
Hydroquinone	3 "
Water	1 ounce.

Caustic potash produces almost identical results as the soda. I say 95 per cent. pure, because there is no perceptible difference in the action of that quality and chemically pure, and it is in much more convenient form to handle. This solution will keep indefinitely; when that is not desirable, and only ten or a dozen plates are to be developed, half the quantity of sulphite only would be

required, and with less sulphite the action is more rapid, as the sulphite acts as a powerful restrainer. This developer can be made and used without any sulphite, and will last about as long as the old pyro and ammonia developer, but is so rapid in its action that it is hardly controllable; 3 grains of sulphite to the ounce will more than double the time required for development. Bromide does not act as a restrainer in these developers.

For developing positives, 2 or 3 grains of bromide of sodium to the ounce might add brilliancy, but no retarding effect would be perceptible if you should add 10 or 20 grains. Hydroxylamine is the proper restraining agent, if any should be required, and 1 grain to the ounce is the maximum quantity; half a grain will answer the purpose.

I will now give a mixed developer. This is a modification of a recently published developer:

Caustic soda.....	1 grain.
Sulphite of soda.....	15 grains.
Rochelle salts.....	15 "
Carbonate of lithium.....	3 "
Hydroquinone.....	3 "
Water.....	1 ounce.

This developer can be used with pyro instead of hydroquinone, if preferred, but if repeated development is required with the same developer the grain of caustic soda should be omitted. This developer will keep indefinitely, and the oxidation is slower than any I have yet worked.

To develop an exposed plate and obtain a superlative negative there are a few things which are imperatively necessary. The first of these relates to the quality of the plate; next, the exposure, and the kind and strength of developer must be exactly adapted to each other. This can be done, or at least the way I have adopted is as follows: I have three graduate glasses, into one of which I pour sufficient old developer for the size of plate in hand; into the next glass I have a mixed developer, half old and half fresh; into the last one I put only fresh developer. The developer I am now speaking of should be one of those the formula for which I have just given, because they are developers which keep indefinitely, and after using should not be thrown away, but emptied into a bottle kept expressly for developers that have been used; never return the developer that has been used to the bottle containing the fresh.

The plate for out-door time work should be over-exposed for the fresh developer; say I am using the light, and a stop to my lens which, for the fresh developer, would require only two seconds, I give six or eight, at least, with a good light, with the sun at my back or partially so. If I am exposing with the sun in my face I give, at least, twelve seconds. With a good plate so exposed, with my developer arranged as stated, I am sure of a superlative negative, because by feeling my way, commencing with the old developer, I can adapt my developer absolutely to the requirements resulting from the exposure. If my exposure has been sufficient for the old developer I only use that; if, however, the high lights come too fast for the shadows I pour it back and flow the plate with the contents of the second glass; if it now proceeds too rapidly I pour it back and take again the old, watching results, and never allowing myself to get in a hurry.

The development of a plate which has been started by a developer stronger than necessary can be carried to completion by the old developer or one that is much less energetic.

It will be readily seen how, by this method, we can hardly fail of obtaining a beautiful negative which, of all the wonderful things in nature, can properly be classified among the most wonderful.

If, sixty-five or seventy years ago, we had been told that there lived a man who possessed the power or secret by which, on a delicately prepared surface of nearly white, he could, by certain magical manipulation, bring forth from this surface angelic forms of beauty, and could produce exact portraits of human beings, and could also reproduce the landscape in all its beauty, its rugged cliffs and towering mountains, with lakes at their feet, which mirrored all above them; broad fields, with waving grain, fruits and flowers, and even the moving train speeding at the rate of thirty or forty miles an hour—such a story would have entirely eclipsed the one told of Aladdin's wonderful lamp, and the man would have been looked upon as one of the greatest magicians that had ever lived, but the difference between our story and that of Aladdin's lamp is, that was false and ours is true.

The foregoing remarks were followed by an exhibition of slides made by Mr. Newton, which proved a perfect justification of what he had described. Among the slides shown were several from instantaneous negatives made on celluloid films, a noticeable feature of which was the entire absence of granularity, and the qualities of which were extremely beautiful.

PRESERVING FERROUS OXALATE DEVELOPER.

BY W. E. PARTRIDGE.

EVERY ONE who has used the iron developer has a sneaking regard for it. The clear glass, pure black and white color and the general pluck and brilliancy of the negatives which can be produced, are all in its favor. And when it comes to making bromide prints, why one has to use the iron or go without bromides. At least that was true only a short time ago. But when one uses the iron developer but once in three months the iron solution gets into a condition which drives one wild. Well, there are ways of preserving the stuff—the books say so and it must be true. Some eight or ten years ago we began to try the different methods. First, there was the double-mouthed bottle with a tube from the opening near the bottom. It was supposed that this, by excluding the air entirely from the ferrous oxalate, would make the preservation perfect. So we got a bottle with a side opening. There was a nice rubber tube, and a contrivance for stopping the flow. The air could be absolutely excluded from the liquid. Surely this would be an end of all tribulation. But it wasn't—not by any means. In about a week we found the developer drying and oxidizing inside of the tube in a most outrageous and unendurable way. There was no way of cleaning the tube, and the result was that after a few weeks use the apparatus was thrown away with many maledictions upon the head of the inventor.

Then came the oil theory. Put a layer of paraffine oil over the top of your developer and all would be well. Kerosene was cheap and the experiment cost nothing. This sounded well. The wet plate would go under the oil and none could stick to it. The developer, properly protected from the air even while in the tray, would work beautifully. Did it? We should say not. The oil stuck to the plate and to the tray, and likewise to our memory. To this day we have

a grudge against the man who proposed it. We should like to put him into a swimming bath "with a layer of oil on the top." We should like to have him wet before he went in "so that the oil would not stick." We should like to hear his remarks after he came out. We fancy we should be gratified. Probably our feelings would be relieved. But wouldn't he have oil in his hair? Didn't our plates have oil in their hair? and likewise all over.

Then another monumental idiot suggested putting a little castor oil into the stock bottle. The old developer could be poured in, or the new one for that matter, and the oil would perfectly protect the developer. And we tried it. And "such a gettin' up stairs." That was theory. It was based on the supposition that because oil is lighter than water it would stay on top. But it didn't. That oil broke up in small globules. It went all through that developer. It sailed out on the plate. It caused hard feelings. It broke the commandments. It committed murder—in the heart, at least. It was very sinful. And in spite of all this, the developer would not keep.

Then we tried a new plan for a time. Everybody said that it was best to keep old developer. So we kept it. When a plate was finished we carefully poured the developer we had used into a stock-bottle. When we developed a plate we mixed new developer, and after using it put it into the stock-bottle. When the bottle was full we poured some out to make room for more of that which had been used once. Then our friends asked, how do you use the old developer? We answered always, we do not use it. All the authorities say it's a good plan to keep it; so we keep it, but for the sake of our negatives we never use it. Well, that disposed of the question of keeping the old mixed developer. If you never use it, the keeping will present no difficulties beyond that of getting a glass bottle.

Now we come face to face with the keeping of the iron. Well, sulphuric acid was a fraud. It might answer for two or three weeks, but at the critical time it failed. It was no fool of a task to get pure, clear green crystals of sulphate of iron free from the white hydrated spots. It had to be picked over and every speck taken out. Even then it was not always perfect.

Somebody said use tartaric acid, and set it in the sun. This will work beautifully for a while, but just when you have to make a bromide, and there hasn't been any sun for a week, you get left. Your iron is as yellow as your famous "yellow dog." One thing we did not try. Putting in bicarbonate of soda and a little acid and making a carbonic acid atmosphere within the bottle. Perhaps it worked and perhaps it did not.

Sometimes, with all the solution spoiled, we took the crystals and pounded them up in a cloth and put the powder in the developer. But we got desperate. Every bottle in the house was spoiled by iron solution. We made raids on the neighbors; we robbed the ash-barrels of every promising bottle.

But our wrath reached its culmination within a week, long after we had given up the oxalate development. Meeting Dr. Higgins a day or two ago, he coolly tells us that it doesn't matter if the iron isn't perfectly clear. He buys common copperas for three cents per pound, air-slaked and dirty, lets it lie till it is white all over, or even falls to powder, and then uses the stuff. He says the negatives don't suffer, nor the lantern slides. He doesn't care if the iron does not keep. We all know what kind of work the doctor makes. His say, therefore, in regard to iron is enough. But is this a nice end for a sermon? Don't

we, who have tried oil and picked over sulphate of iron feel good after all our tribulation to be told that it is all to no purpose? We complain that all plans for keeping have failed, and the doctor meets us with the cool statement that no harm is done if it does not keep. It is just as good after it has turned.

It is pretty hard to forgive Dr. Higgins, but we believe we can. But we give fair warning. We do not intend to forgive those fellows who set up the keeping "fakes" on a confiding scientific world. Do they not deserve to hang with "Danny Deever in the morning!"

ADDITION OF FORMALDEHYDE-BISULPHITE OF SODA TO THE GELATINE EMULSION AND TO THE DEVELOPER.

BY DR. J. M. EDER.

THROUGH the kindness of Dr. Kraus in Köthen, I obtained a sample of formaldehyde-bisulphite of soda (oxymethyl sulphonate of soda), with a substance designated as preparation No. II, which, according to the formula, is composed of the following :

PREPARATION II.

Sulphonate of soda (oxymethyl).....	150 parts,
" ammonia (oxymethyl).....	150 "
Coloring matter.....	1 part,

and is obtained by precipitating an aqueous Fuchsin solution with aqueous oxymethyl sulphonic acid (formaldehyde-sulphurous acid), washing and drying.

According to the formula, the preparation II is to serve as an addition to the emulsion during digestion, while a mixture of the pure formaldehyde-bisulphite of soda is recommended as accelerator to the developer.

In this connection I caused some experiments to be made by Messrs. R. von Reisinger and Heitingcr.

(1.) ADDITION OF THE PREPARATION II TO THE EMULSION.

The formula which accompanied the preparation says : In preparing plates after one of the ordinary emulsion processes $1\frac{1}{2}$ per cent. of the halogen silver present is added, before ripening, to preparation II, and one proceeds otherwise as usually. (Preparation II is to be protected from moisture, and should not be kept in tin vessels.) The time of ripening can be reduced by such addition, removing thus the danger of fogging, and still obtaining at the same time highly sensitive and, to a certain degree, orthochromatic plates.

In the production of ammonia oxide of silver the mixture containing formaldehyde (II) was therefore added to the bromide gelatine solution before mixing and digested for half an hour ; for parallel tests an analogous emulsion without this addition was produced.

The results with both emulsions were, that the addition of the formaldehyde mixture had not materially reduced the time of ripening, but it acted as an anti-fog in the emulsion.

A remarkable increase of the sensitiveness by this addition was not observed, and half an hour's digestion resulted even in a reduction of the sensitiveness, compared with the ordinary emulsion.

(2.) ADDITION OF THE FORMALDEHYDE-BISULPHITE OF SODA TO THE DEVELOPER.

About this the formula says : If the formaldehyde-bisulphite of soda (preparation I) is applied in the preparation of a hydroquinone or pyro developer of

separate solutions in place of the usual sulphite of soda, the hydroquinone or pyro can be reduced to one-quarter of the amount generally used, without detriment to action. The solutions so produced are absolutely stable.

The experiments made with the ordinary pyro-soda developer, compared with a pyro solution, which was mixed with preparation I (in place of the generally used sulphite of soda), results, by application of personally prepared bromide of silver gelatine plates (ammonia method) in the increase of the sensitiveness by two numbers of the Warnerke sensitometer, and satisfactory appearance of the plate without fog.

But not every test gave the same favorable result with regard to an increase of the sensitiveness by application of preparation II in the developer, so that it is questionable if an advantage can be gained by the introduction of this preparation into the ordinary pyro-developer.

(3.) APPLICATION OF FORMALDEHYDE MIXTURES AS A PRELIMINARY BATH.

About the production of the same the formula says :

Preparation I.....	2 parts.
Carbonate of soda (free from water).....	1 part.

or

Preparation I.....	2 parts.
Carbonate of ammonia.....	1 part.

These are pulverized finely, and thoroughly mixed. Mixture II acts more powerfully than mixture I, but, as the former is absolutely durable, it is to be preferred.

A solution of this salt in water (1.1000 to 1.2000) is applied as a preliminary bath for bromide of silver gelatine plates after exposure and before development.

This preliminary bath, applied for about half a minute, has the effect that the plate will develop quicker and much more powerfully in the oxalate of iron developer, and will give more detail in the shadows of under-exposed plates.

It is advisable, though, to wash the plate before immersion into the oxalate developer to avoid fog.

In general this bath acts the same as the ordinary fixing soda preliminary bath.

(4) ADDITION OF FORMALDEHYDE-BISULPHITE OF SODA TO THE OXALATE OF IRON DEVELOPER.

The formula says :

Oxalate of iron.....	225 parts.
Neutral oxalate of potassium.....	2,000 "
Preparation I.....	400 "
Fine citric acid.....	10 "

finely pulverized and thoroughly mixed. By simple dissolving of 25 grains in 100 c.c. of water a durable developer is obtained, which, kept in full sunlight, regains its strength lost during use until preparation I has been fully oxidized, which, of course, takes a considerable time.

The tests about this developer mixture are still being made, and have not been concluded yet.

All communications for the columns of the BULLETIN should reach us on Monday preceding the day of issue, to insure their publication at that time.

THE CHEMISTRY OF COPPER AND ITS SALTS AND THEIR BEHAVIOR IN PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

(Continued.)

CUPROUS iodide, Cu_2I_2 , is white, insoluble in water and alcohol, little soluble in aqueous ammonia, and resembles cuprous bromide in its essential properties.

A copper plate exposed to the vapors of iodine, or immersed in a solution of this metalloid in water, becomes covered with a white adherent film of cuprous iodide which, after exposure to light, refuses to amalgamate. The latter phenomenon, first observed by Salmon and Garnier, led them to the discovery of the photo-engraving process following. An iodized copper plate is exposed under a negative or a positive, then rubbed with mercury, which adheres only on the parts not acted on, and finally inked. But as the ink is repelled by the mercury, and takes on the other parts, a design is formed in white (the mercury) on a black inked ground, or *vice versa*, and it, therefore, suffices to bite-in with a silver solution slightly acidified with nitric acid to obtain a copper plate engraved in relief, or in intaglio, taking the usual stopping-out precautions.*

According to Renault,† cuprous iodide is less sensitive to the action of light than either the chloride or bromide. After an hour insolation under a negative, if the plate is quite dry, only a faint impression is visible, while under the same circumstances the chlorinized and bromized plates are rapidly acted on. A remarkable particularity is this one: When, after a sufficient insolation the plate is immersed in a dilute solution of mercuric nitrate, the parts not insulated become brick red, and those which have been acted on by light assume the characteristic color of mercuric iodide.

The cuprous iodide, whether acted on by light or not, is insoluble in sodium chloride, potassium and ammonium bromide, sodium sulphite and potassium nitrate, and is soluble in sodium thiosulphate, potassium cyanide, ammonium sulphate, dilute sulphuric acid and nitric acid. The cuprous iodide acted on is a little less soluble in ammonium sulphate.

Cupric iodide, CuI , is an unstable compound which presents little interest.

Cuprous oxide (cuprosium), Cu_2O , occurs as a red powder, unalterable in the air at common temperatures, and, when heated, is converted into cupric oxide. It dissolves without alteration in hydrochloric acid, from which it is precipitated by water. The oxyacids—diluted—decompose it, forming cupric salts and precipitating metallic copper. It dissolves in ammonium hydrate; the solution, which is colorless at first, becomes blue from oxidation of the cuprous oxide to cupric oxide.

Cuprous oxide can be prepared by decomposing cupric sulphate by glucose in presence of potassium hydrate. The blue solution deposits the oxide by ebullition.

In the arts it is melted with vitrifiable matters to color them red. The ruby glass, employed in photography to light the dark room, transmits red light mixed with a certain amount of blue rays.

Cupric oxide (cupricum). The anhydride, CuO , is produced by the calcination of copper nitrate. It occurs as a dark brown, almost black mass,

* Bull. Soc. Franc. Phot., Vol. I, page 80, *et seq.* Humphrey's Photo. Jour., Vol. VII, page 240, *et seq.*

† *Loc. cit.*

which dissolves in acids. It is employed to color glass, porcelain, etc., green or blue. The latter color is obtained when the flux is alkaline.

The hydroxide, $\text{Cu}(\text{OH})_2$, is the blue precipitate formed by double decomposition with potassium hydrate. It is unstable, being converted into the black oxide by a feeble heat.

Anhydrous or hydrated cupric oxide is soluble in oil, and generally in greasy matters, which it tinges green. This every one has noticed by keeping these substances in copper vessels. The coloration is due, then, to the hydrate and carbonate formed by contact with the air.

Cupric sulphate (blue vitriol or copperas), CuSO_4 . This salt crystallizes in prisms containing $5\text{H}_2\text{O}$. The crystals effloresce in the air, losing $2\text{H}_2\text{O}$, and are decomposed at a low red heat into cupric oxide, with evolution of oxygen and sulphur dioxide:



The reaction of cupric sulphate is acid, its taste styptic and metallic. It dissolves in 4 parts of water at 15 degrees C., and in 2 parts of boiling water. It is insoluble in alcohol.

Like all the salts of copper, it acts as a violent poison. The best antidotes are iron reduced by hydrogen, potassium ferrocyanate and albumen.*

Cupric sulphate is prepared by roasting copper pyrites, CuFeS_2 , in a reverberatory furnace.

Copper carbonate. It occurs native as a dibasic salt, CuCO_3 , CuO , H_2O , and as a sesquibasic salt, 2CuCO_3 , CuO , H_2O . The former constitutes the beautiful mineral malachite, found in the Ural Mountains. The latter is the azurite which, pulverized, forms the blue ash of painters. The carbonate obtained by adding sodium carbonate in excess to a solution of cupric sulphate is of a pale blue color, which turns green by heating. Formula CuCO_3 , CuO , H_2O .

Reactions. All the salts of copper rubbed on iron with a damp rag leave a reduction of metallic copper which, treated by hydrochloric acid, gives a yellowish solution turning blue by addition of ammonium hydrate.

Cuprous Salts. Potassium hydrate produces a yellow brown precipitate of cuprous hydrate.

Ammonium hydrate forms a colorless precipitate which becomes blue in the air. Ammonium carbonate acts as the hydrate.

Potassium and sodium carbonates produce a yellowish precipitate.

Potassium ferrocyanide produces a white precipitate which becomes red brown in the air.

Potassium ferricyanide produces a chestnut brown precipitate.

Hydrogen sulphide produces a brown precipitate.

Ammonium sulph-hydrate produces a black precipitate.

Cupric salts. Potassium and sodium hydrates produce a blue precipitate of cupric hydrate, which is converted into the black anhydrous oxide by ebullition.

The carbonates of the alkalies produce a blue precipitate turning black by ebullition.

Ammonium hydrate and ammonium carbonate produce a green precipitate soluble in excess. The solution is blue.

Potassium cyanide produces a yellow precipitate soluble in excess.

Potassium ferrocyanide produces a chocolate brown precipitate. This test is exceedingly sensitive, forming a visible precipitate in a solution containing 1 (one) part of a cupric salt in 400,000 parts of water.

Potassium ferricyanide produces a yellow green precipitate insoluble in dilute acids.

* Copper is too often employed to impart a fine green color to preserves. It is detected by incinerating the articles, washing the ashes and adding aqueous ammonia to the filtrate, when if copper is present, the solution is at once tinged blue.

Chlorophyll is recommended instead of a copper compound for the purpose in question.

The artificial green colors which are so venomous are now generally discarded in the arts for chromium greens, especially the hydrated sesquioxide, which is quite stable in air and light, and of a splendid green.

Hydrogen sulphide and ammonium sulph-hydrate produce a black precipitate.

Potassium iodide produces a precipitate of cuprous iodide.

Potassium chromate produces a red brown precipitate soluble in excess.

The salts of copper color the flame of alcohol green.

COLUMBIA COLLEGE EXHIBITION.

THE Fifth Annual Exhibition of the Columbia College Amateur Photographic Society was held in the Chemical Museum of the School of Mines, 49th street and Fourth avenue, on the evenings of April 17th and 18th.

The exhibition comprised somewhat under four hundred and fifty views, covering almost every kind of work, and was upon the whole extremely creditable to the Society.

The number of individual exhibitions was close upon twenty-five. And in our judgment the one quality which showed itself most conspicuously through all the work was composition and taste in arrangement of subjects.

Of course we all have still much to learn before we can pose a subject or arrange a group or landscape in such a manner that the resulting photograph shall be a picture; but we feel that the work shown on this occasion evidenced a considerable advance over much that has been exhibited within the last year in this direction; and in this connection we would say that we believe a landscape requires just as much, or more, posing and arrangement as an individual or group, only that in one case the sitters are moved and grouped till the composition is harmonious, while in the other the camera must be placed in such a position—seldom found without careful study and frequent change—that the lines of the landscape compose themselves into a harmonious whole, each accessory of which leads up to and accentuates a central or principal object or feature of the composition. With this feeling prominent in our minds, and also remembering that the work exhibited is the outgrowth of a desire, on the part of the producers, to utilize their otherwise leisure time for the expansion of their art tendencies, we will proceed to a more detailed view of the results placed before us.

The first collection which attracted notice was that of Henry R. Taylor, which was composed principally of surf studies and marine and landscape combinations, $6\frac{1}{2} \times 8\frac{1}{2}$. Many of these prints, notably one of Sachnest Point, were made during the great storm of last September, and under conditions which would ordinarily be considered quite unphotographic, but the artist has contrived to obtain some beautiful effects, and the picture named is quite remarkable in the amount of detail in all parts. It may be said to be divided into three grades of colors: the surf, which is of a soft and brilliant tone; the sky, which comes as a half tone of gray, and the sea-weed covered rocks in foreground which form the heavy shadow color, and all three are beautifully full of detail, and bear to each other much more nearly the proper relations, or color values, than would have been the case had the exposure been made under a strong and brilliant light. The artist, too, by printing this negative in platinum, has emphasized all its best qualities.

Another view, called by the same artist "Bateman's Point, Newport," shows a very happy selection of subject, and demonstrates that one must seize the opportunity when it presents itself if he would obtain the best effects; the noticeable point in this view being the amount of life and action in the surf

which, though not breaking, is yet full of that vast latent power which characterizes a long ground swell after a storm. The lighting here is somber, which helps to give detail in the high lights and shadows equally.

Next in order came a collection of prints from negatives by Julien T. Davies, Jr., most of which were instantaneous, and which showed merit in many qualities, but lacked that clean, brilliant crispness so necessary to a really good photograph of out-door life. The best print in this collection was a view of a life-saving crew launching the life-boat. The view was a quick one, but was full of life and action, and the focusing was sharp to a degree. A trouble was noticeable here, which occurred to a greater or less extent among a few of the other exhibits, namely, hasty development, as evinced by streaks caused by uneven flowing of the plate with developer, and poor toning of the prints. These prints were from $6\frac{1}{2} \times 8\frac{1}{2}$ plates, as was also another series of views by the same artist of "Surf Studies at Newport," which were not only clean and well printed, but were also well selected and well lighted. A collection of 4×5 views on the Nepigon River, however, was superior to either of the others, one picture of Indians in canoes, with heavy wood scenery, lake and foreground being particularly pleasing.

John J. Neeser, Jr., was represented with a lot of small detective views $2\frac{1}{2}$ inches in diameter, which showed not only technical skill in manipulation of plates and developer, but a true artistic feeling and instinct. One to examine these views cannot but feel that the one who selected them was a true lover of the beautiful in nature. One subject in particular, "Mirror Lake," is deserving of special mention. Most of this series were made in the Yosemite and Yellowstone Park.

Another exhibitor of scenery somewhat similar in character was J. Welling Giddings, whose work was from 5×8 plates, and which was clean, brilliant and well chosen. Prominent in this set were views of the Grand Cañon of the Yosemite and several beautiful formations of the Limestone scenery of the Yellowstone Park.

J. S. Hoyt had a large and excellent collection of prints covering a great variety of subjects and showing him to be an enthusiast in the art. A somewhat remarkable result is shown by him in his picture $6\frac{1}{2} \times 8\frac{1}{2}$, made by a single flash of lightning at 9.30 o'clock in the evening, during a rain storm. The negative shows a large house and grounds by the shore, and stretching way beyond is very clearly discernable the landscape with its line of hills and shore merging into the sky. The detail throughout this picture, showing as it does the balconies, doors and windows of the house, trees and everything about the place, is remarkable and of great interest. Another plate by the same artist represents the interior of a large entrance hall, through which may be seen a room beyond. This picture is called a magnesium flash, and in the main it is so, but it is apparent that daylight has something to do with the room, from the direction of the shadows. We mention this, because the title would seem to imply that only magnesium was used. The result was very creditable and one to be studied by all interested in flash lighting of interiors. It was obtained by a number of flashes repeated in rapid succession, and is entirely free from the fog so commonly seen in such cases, which is caused by the actinic quality of the smoke from the previous discharges. His best effort, however, is in the two pictures representing the college tug-of-war team, made in the Campus, with the stone buildings serving

as background. The pictures are portraits, the figures alive with suspended motion, and the grouping and lighting excellent. He is to be congratulated on the quality of these prints.

Next in line comes a large collection of views from the camera of C. W. Trippe. These are illustrative of a voyage to Europe, and include, beside the many picturesque views aboard ship, numerous landscape and character studies on the other side the water.

The quality of this collection is extremely good, not only as regards the negatives themselves, but the printing, toning and mounting as well. And just here we are reminded that the true comparison of results cannot be arrived at unless each competitor performs every operation, from exposure of the plate to the burnishing of the finished print, himself. He who does otherwise puts himself in a false light before his competitors, unless, of course, it is understood beforehand that portions of the work may be delegated to others.

We do not know what rules were laid down for the government of this exhibition, but from what we saw we were impressed with the thought that some of the work shown bore the impress of the gallery in some of its features. Mr. Trippe's views were replete with character and life, and many on board ship were strikingly full of animation, the grouping showing the advantage of a detective as an aid in obtaining records of pose and movement when made without consciousness of observation.

One charming little view in this group, and one which was unique in the exhibition, was a bit of sky and water only, the clouds and sunset effect showing in a manner which only needed the color to rival a Turner.

H. S. Curtis exhibited several prints which, while showing that he aspires to the accomplishment of great results, would have been more interesting had the composition been more carefully looked after and a less extensive field of vision covered. His views seemed to lack that objective point so necessary to be found, and which when apparent in a picture accentuates every one of its accessories.

C. H. Young exhibited a series of landscape subjects which were very pleasing. The prints were of a delightful tone, the details in shadows clear and brilliant, and high lights crisp and clean. The whole effect of this collection was perhaps as charming as any in the room. The composition was carefully looked after and the lighting excellent.

A small collection of prints by F. T. Zabriskie was shown by D. W. Taylor, among the most noticeable of which were two brook views, a study of cloud effect, all three of which were charming.

Henry M. Brookfield exhibited a few prints, the most prominent among which was a river view, Thomasville, Ga., good in scope and of excellent tone in the finished print.

Next to this exhibit was one—the only one of its kind, we are happy to say, which was visible—and we do not wish to be considered unkind when we advise contributors having as good a set of negatives as was here shown by Frank W. Kinsey, not to contribute if they cannot do so in a more dignified manner than through the agency of blue prints. Mr. Kinsey's negatives were good, entirely too good to have been treated in this way, and we predict that if he will in future print in silver or some of the more somber processes he will abandon ferro-prussiate paper forever for purposes of exhibition.

Charles Bartow had a collection of portrait and figure work, one specimen in

particular—the full-face view of a young boy, being very carefully lighted and well posed. Several views of boys at play and in studied poses showed good taste and judgment in arrangement, but the models were in most cases too conscious of posing to give perfect harmony. Two pictures of a tricky nature, the first representing a culprit about to be beheaded, and the second exhibiting the executioner holding the apparently severed head in full view, while the remainder of the victim's body was still visible in the foreground, was an unique and rather startling conception, but one which was well worked out.

Dwight W. Taylor was represented by a collection of views of Niagara, which were on the whole interesting and fairly good, but which probably suffered more in the printing and toning than in the negatives.

One of the most conspicuously pleasing exhibits was that made by Werner Boecklin, which was made up almost wholly of Swiss mountain scenery, and which, aside from the beauty of the subjects themselves, was generally of exceeding technical merit. The entire result was evidently wrought out by a careful attention to all details in each step, from the placing of the camera in position to the placing of the pictures on the wall before us. The tones of the prints were uniformly good and the general effect charming.

Charles W. Stoughton, evidently an enthusiast, exhibited nine portrait and figure studies, all of which were good, but of which two in particular appeared to us to be even better than that. One, a young girl seated, holding a tea cup, and habited in the quaint attire of long ago, was especially pleasing. The lighting and modeling were capital and the pose most easy and natural. The other which especially interested us was a group of three girls standing, and which was handled with much skill and taste.

W. T. Clerk showed a collection of views from almost every clime and of greatly varying dimensions, including almost everything from the diminutive vest camera, to 11 x 14. One of his best was a 5 x 8 of Nassau, Bahama, which evidenced a thorough acquaintance with the processes necessary to the production of a good picture.

In closing we would remark upon the unfortunate lack of facilities for showing these pictures to best advantage, owing to the fact that the exhibition room is so full of specimen cases, etc., which naturally break up the harmony of an exhibition of this nature; but we hope the time will come when the society will be able to have ample quarters of its own. We would also repeat what we said at the close of our remarks concerning last year's exhibit, regarding the printing, toning and mounting of prints, and would emphasize the statement then made, that a good negative is oftentimes so much disguised by poor work in one or the other of these processes as to be hardly recognized; while a very medium quality of negative may, with careful printing, toning and mounting, be made to show to much better advantage.

THE NEW YORK CAMERA CLUB.

For the past week the rooms of the Camera Club have been thrown open to members and their friends, the attraction being an exhibition of members' work. Though got together at short notice, the exhibition was very representative. The members responded nobly, and the walls were covered with pictures of more than usual merit. One of the most pleasing features was the large number of

lady exhibitors, their work showing great skill in posing and arrangement of details. Flowers and plants tastefully arranged lent an additional charm, and the Camera Club is to be highly congratulated on the complete success of its first exhibition.

William A. Fraser had a fine collection of platinotype prints. These were extremely good, being soft and delicate. "A Lonely Lane," "Old Albany Post Road," and "Views on the Bronx" were especially good.

W. T. Colbron was represented by a large frame containing prints from one negative on seven different papers, albumen, bromide, platinum, ferroproussiate, aristotype, Obernetter and plain paper. This was an excellent idea, giving a good comparison of the different printing processes. Each print showed great skill and care in its production, and the whole thing was very instructive. Several scenes in Florida, by the same gentleman, showed that their author was a photographer of good calibre.

Lindsay C. Ivory's flash lights elicited universal admiration. In each picture was seen Mr. Ivory himself, and although he manipulated both camera and flash, the pictures are practically without a flaw. Much curiosity was aroused as to his method of procedure.

James L. Breese exhibited several portraits of remarkable quality, showing great skill in posing and lighting. Indeed, Frame No. 81, entitled "Portraits," was the best thing in the whole exhibition, and was fully appreciated by all present. For lighting and general technical excellence they could hardly be beaten. Of his prints on plain paper as much cannot be said, these being excellent subjects but poorly printed. One of them, however, a picture of a lady looking through a window, attracted many by reason of the peculiar effect produced by the lighting. This was shown to especial advantage on plain paper. Indeed, this seemed to be the only process by which so successful a rendering could be obtained. Scenes at "Gate Lodge, Newport, R. I.," were also excellently treated.

Mrs. Richard P. Lounsbery was very well represented. Six portraits were excellent out-door studies.

David Williams, the President of the Club, set an example which the members would do well to emulate on future similar occasions. Eight or nine views of the "Castle of Chillon," with appropriate quotations, were especially interesting, though the gem of his exhibit was a frame entitled "Storm-lift in the Alps," a remarkable meteorological study.

These are the finest cloud effects we have ever seen, and testify to the patience and skill of their author. Of several scenes in Frame No. 1, "Lavoir in the Fields" was extremely good. Two women preparing lunch by the side of a brook, with a French peasant leaning against a neighboring tree, made, with the hay and other accessories in the distance, a very artistic picture.

Dr. E. P. Fowler's "Views in Central Park and Portraits," was a capital frame, illustrating what can be done with good subjects and careful treatment. Two full-length figures of ladies in costume, with the side of a conservatory as background, were very artistically treated.

A series of pictures by Miss M. E. Martin, with the same figures, was also excellent. Pictures of "Active Life in and about Cooperstown" were also admirable.

H. T. Duffield, the genial and industrious Secretary, had a fine collection of bromide prints, delicate pieces of woodland scenery, more resembling fine engravings than photographs. Of these "A Woodland Scene," "A Brook" and "Winter Reflections" were very fine. Another frame entitled "Plant Houses" was extremely good, the subject being one requiring careful treatment.

Plain, silver prints of "Scenes near Rye, N. Y.," were capitally executed by J. Howard Wainwright. "Scenes on Governor's Island," by the same gentleman, were also very interesting.

Mrs. Andrew Carnegie showed some very fine Scotch views, and Mrs. Jonathan Thorne's "A September Gale, Black Rock Harbor," was a fine marine

picture. "An Old Salt," by the same lady, was a grand picture—an old man with snowy beard, standing out well from a dark background.

Two scenes in Portland Harbor, by Linzee Prescott, were very pretty, the cloud effects in one of them being remarkably good.

Dr. Sydney Bishop's bromide enlargement, "Behind the Barn," was a capital study. Three urchins, the youngest on a wooden horse, and all endeavoring to indulge in the noxious weed, made up a picture which could not fail to command attention.

Franklin Harper's aristotype, "I Love 'oo," was a very pleasing picture of two little girls embracing.

About one hundred and fifty-five pictures made up the exhibition, and we feel sure that the great success attendant on this, the Club's first exhibition, will stimulate the members to further efforts, besides adding considerably to the muster roll.

SKETCH OF THE SCULPTOR OF DAGUERRE.

J. SCOTT HARTLEY is a noted figure in American sculpture, an art which has taken its rise in this country within the last half century. H. K. Brown, recently deceased; Greenough, of Newport, and E. D. Palmer, of Albany, were the pioneers.

Hartley began his art career under Palmer, of Albany, about twenty-five years ago, a studio whence come men of international prominence.

Since then he has been prolific, variable in idea and illustration, and the number of his works always bearing the signs of an individual genius are remarkable.

Twenty years ago Hartley took a Royal Academy medal in London, and worked and studied in Germany, Italy and France.

When he returned to the United States it was to consort with the new and fresh school of art without accepting any of its extravagancies, and thereby is the strength of this faithful artist.

He was largely concerned in the foundation and subsequent prosperity of the Art Students' League, and was, during the struggling period of this now important factor in the art of the country, twice President and its first Professor of Anatomy, a position which he held for seven years of appreciated service.

Mr. Hartley was the founder of the Salmagundi Club, now the most exclusive and influential body of artists on the Western continent, where men of all specialties in art are welcome, but they must come with good work to pass through the stile.

Hartley's principal works are the statue of Miles Morgan, one of the Pilgrim Fathers, now standing in Springfield, Mass., a commission from H. F. Morgan, of New York. It is a robust figure, 8 feet high, and is well known to all New Englanders. "The Whirlwind," which gave him a high reputation in the realm of plastic art, showing as it did not only a profound knowledge of anatomy, but a subtle treatment of the harmony of lines in drapery and beauty of form. Also a number of reliefs in the Saratoga Monument commemorative of the surrender of Burgoyne. A colossal bust of J. P. Howard, who built the present University of Vermont. A recumbent figure representing the defeat of Satan, which was awarded a gold medal at the American Art Association, 1887, by the artists.

But perhaps what has given Mr. Hartley his greatest fame is the bust of John Gilbert as Sir Peter Teazle, made only a year ago from life, and a month before the great comedian's death. Among his recent sitters have been Edwin Booth, Barrett, Felix Morris, John Ryle, the founder of the silk industries in this country, and that princess of finished actresses, Ada Rehan.

Enumeration is not necessary in the multiform works of this man, who, by acclaim in the art world of New York, is at the top of his profession.

Mr. Hartley was honored by being elected a member of "The Players" two months ago, and is an associate member of the National Academy of New York.

THE TARIFF QUESTION.

To the Editors of the BULLETIN :

I wish to enter my strongest protest against the increase of duty on albumen paper, as proposed in the bill before Congress. It is an unjust as well as needless measure, and one which I hope every photographer in the country will lend his voice and effort to prevent becoming a law.

What reason is there for an increase on the tariff from 15 to 35 per cent., when, as is the case, the best article of the kind which is manufactured in this country to-day *sells at a less price than the imported paper*? The foreign article is sufficiently protected, and its higher cost already shows that it is entirely *out of competition* with domestic makes—it is another kind of merchandise almost. We cannot do our work without the imported paper. Must we then pay an additional duty, amounting to over \$6 a ream, for a necessity *which cannot be made* in this country? WE OUGHT NOT. My fellow-photographers throughout the country should do all in their power to defeat the measure, so far as it applies to albumen paper.

Yours truly,

GEORGE G. ROCKWOOD.

NEW YORK, April 16, 1890.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

WASHINGTON EXHIBITION.

WE have already published the rates governing the coming exhibition, but the following addition to that information is contained in the circular that has just reached us from the Committee.

There has been a very liberal classification of art productions and awards for same to be given at the Washington Exhibition, and it is hoped and expected that there will be a ready response to the same, so that long before the Convention opens, a knowledge of what is to come will enable the officers to be fully prepared for all entries, that each one may be properly classified and hung.

Kindly remember that *it is impossible* in any such exhibition to have *all* pictures hang in the best light or position to suit them, but every precaution and care will be taken, as far as it is possible, to have justice done them. On account of the very limited space at the disposal of the Committee, a restriction has been placed as aforesaid on each class, yet for the best interest of many exhibitors, a small show is one which may contain really more meritorious work. At the Boston Convention I felt impressed with the *fact* that those exhibits which had no glass in the frames were the better lighted (doing away with all reflected light), and admitting the judges and public to better get the true values of the work; it also lessens the weight in boxing and handling, and liability of breakage which would injure the photos. I would request *all* exhibitors to send with their work screw eyes, cord, and signs or tablets, so that the hanging committee may not be put to trouble and expense, as it is the plan to have *all exhibits* hung before the opening of the Convention, thereby saving noise and time, and having all members in attendance at the business sessions. It is very natural for all to postpone in sending exhibits until within a few days before the opening of the exhibition; but this year arrangements will be made at the railroad stations in Washington to hold anything sent until the proper time to send them to the hall, so that no one need feel any uncertainty about the safety or disposition of the same.

These remarks may seem uncalled for, but believing it will be of advantage to all concerned, thought best to publish this circular. Let us make the coming Convention and Exhibition of Art Productions the banner one of the Association, that all who visit it may be more than repaid for time and money spent by an increased interest in and knowledge of photographic art.

Have your box covers screwed down instead of nailed; help your committee all you can by promptly forwarding entries and exhibits. There is enough for them to do even if these rules and suggestions are fully carried out.

Very respectfully and fraternally,

GEORGE H. HASTINGS,
For the Committee.

The following notes relative to the OBJECTS OF THE ASSOCIATION come to us from the office of the Treasurer :

The advancement of the art of photography.

The elevation of the professional character of its devotees.

The establishment of a higher and more perfect system of conducting the business.

The promotion of friendly intercourse.

A unity of methods which points to the greater success of photography as an art.

The diffusion of scientific knowledge among its members by fostering photographic literature, stimulating discovery and inventions, and the encouragement in all legitimate ways the broadest and highest possible range of photographic production.

To *discourage* and oppose any unjust imposition which tends to hamper the progress of the art.

To inaugurate exhibitions of photographic production on a scale commensurate with the progress of art.

Is not this Association worthy of your support? Any photographer of good moral and professional standing is eligible. If not already a member, lose no time in uniting yourself with an organization already a power in the land. It has stood the test of time (eleven years), and has a creditable standing throughout the length and breadth of the civilized world.

To become a member, send \$5 if a proprietor, and \$2 if an employee (which pays entrance fee and dues for first year), to the Treasurer, G. M. Carlisle, Providence, R. I. If already a member, kindly remit your dues (\$2), and by so doing avoid waiting your turn at the entrance when you arrive at the Convention, as none can be admitted whose annual dues remain unpaid.

EXTRACT FROM CONSTITUTION.

ARTICLE 2, SECTION 4.—The annual dues become payable on January first of each year, and any member failing to pay the same prior to the adjournment of the annual convention shall forfeit his right to membership, and can only be reinstated on payment of an initiation fee (\$3) and (\$2) dues, \$5, as provided in case of admission of new members.

Eleventh Annual Convention to be held at Washington, D. C., August 12th to 15th, inclusive. A beautiful memorial to Daguerre to be unveiled.

Become a member and get the benefits of the art lectures, practical talks, and a grand exhibition of photographic productions and stock exhibit.

OUR ILLUSTRATION.

THE handsome photo-gravure with which we illustrate this issue of the BULLETIN is from a negative by Mr. Robert S. Redfield, the Secretary of the Photographic Society of Philadelphia. It is a group of cattle enjoying life in a New England pasture, and was taken on a June morning, with instantaneous exposure. As illustrative of the thought of its title the picture is a gem, and the skill with which it was caught speaks well for the photographer. The photo-gravure also leaves nothing to be desired in regard to quality.

“MY RESITTERS.”

BY G. H. LOOMIS.

It is sometime since we have heard from our friend and facetious contributor, Mr. G. H. Loomis, but here he is, with merry jingle, and we think that the fraternity generally will join in the smile his verses are liable to inspire. The best and most painstaking artists are often *re-visited* by their sitters, and the “peculiar complaints” of many of them are amusingly rehearsed in the following poem.

EDS.

Now and then we have our days,
When everything goes contra ways—
When patience fails to hold its own,
And placid temper gets dethroned.

These days are those, when nine in ten,
Return with proofs to sit again,
And give the operator fight,
Because he didn't set them right.

“Look here my friend,” says Number One,
“Just look and see what you have done;
Of all the pictures I've had taken,
None like this so God forsaken.

“When you ‘took me,’ may I ask,
Did I wear a donkey's mask,
Else how could I have such ears
As plainly on this proof appears?”

“And pray where was your focal point
To get my mouth so out of joint?
And then my nose, it looks as though
It had received a fatal blow.

“Till now, I thought my eyes alike,
But one is dark, the other light,
All owing to the careless way
In which I sat the other day.

“Now, Mr. Poser, will you mind
If I sit a second time,
To so arrange my head and face,
To get my features into place?”

But here comes Number Two, to say
That “when she sat the other day,
She knew the thing would be a fright,
Because her bangs were curled so tight.

“And then an artist ought to know
Better than pose me so.
That only half my face is shown—
One eye and ear entirely gone.

“And now, I think, I told my daughter
That I really thought I oughter
Wait a week or ten days longer,
Till my nerves were somewhat stronger.

“For you can see my under lip
Has had a touch of the *La Grippe*.
And then I want to sit again,
So not to show my double chin.

- “ And then, the collar that I wore,
 When I was here to sit before,
 Was one I of my sister borrowed,
 And, as you see, it looks just horrid.
- “ My dress waist, too, was all askew,
 And when I sat I really knew
 I should not like it, for you see
 The thing was never made for me.
- “ It really seems to me as though
 A first-class artist ought to know
 When things are right and when they're wrong—
 When things are off and when they're on.
- “ And yet, I now remember, when
 I took a peep into a lens,
 And surely as my name is Brown,
 I saw the sitter upside down.”

Number Three now comes to hand,
 And says he don't quite understand
 Why, taking body, boots and all,
 His big head should look so small ;

And why his polished auburn hair,
 Fresh from the barber's tender care,
 Should photograph so very old,
 With silver gloss instead of gold.

And then the dickey that he wore—
 He never had it on before,
 And kept a thinking all the while
 He'd change it for another style.

But for the reason that he heard
 The patient artist “ Dickey Bird ”
 Would not give up till he had tried
 To get his patrons satisfied ;

And hence this time I've come to get
 A larger head in a vignette,
 And, if no extra charge to pay,
 Please take this button-hole bouquet.

But, alas ! as I'm alive,
 Here come Number Four and Five ;
 A bridal pair, with proofs in hand,
 Once again to sit or stand.

What is the trouble ? Let us see.
 The grouping wrong ? What can it be ?
 Oh, that *is* it, you look so sad,
 When you meant to look so glad ?

And then it seems as though the bride
 Should sit or stand the other side,
 And incline more towards each other,
 Like a sister and a brother.

But another reason why
 We have come again to try,
 The bride forgot to wear her veil
 And I left off my swallow-tail.

Of course it seems a little green,
But then the artist should have seen
How very strange we did appear
Without the usual wedding gear.

But here comes darling baby mine,
To see what luck a second time ;
The faded proofs and numbers show
'Twas taken weeks and months ago ;

Since which the cunning chap has grown
So big that he can stand alone,
And now the merry little one
Is in for frolic and for fun.

Our orders are to have him stand
Just like a soldier, if we can ;
And if we can't, to sit him down
Like a monarch with his crown.

And so we try the soldier game,
But fail to catch him just the same ;
And when we try for king and crown,
He doubles up to knock us down.

At last we catch the little peep,
But not till he is fast asleep ;
And so I heard his mother say
She'd bring him in some other day.

One more nonsuited one has come,
And says he "left his proofs at home,
The horrid thing 's so black and blue
That friends exclaim, 'Can that be you?'

"Of course I've not a cherub's cheek,
And am not handsome, so to speak ;
But I confess a great surprise
To see such mouth and nose and eyes.

"I know there must be some mistake,
I could not such a picture take ;
Who else that day was in your room
That looked so much like a baboon ?

" 'Satisfaction guaranteed,'
Is the way the ticket reads ;
And so I'll sit and sit again,
If it bursts your old machine."

REFLECTIONS.

One dear, delightful thought
Comes to me o'er and o'er,
That as I older grow
Must learn some more and more.

'Tis rest enough for me
To learn to light and pose,
I must more thoughtful be
About my patrons' clothes.

And should mistakes occur,
As they will sometime,
It must not be the sitter's fault,
But mine, and only mine.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.**ST. LOUIS CAMERA CLUB.**

THE regular meeting of the St. Louis Camera Club, April 1st, 1890, was called to order at 8.30 P.M., with twenty-five members present.

The minutes of the last meeting were read and approved as read.

This being the meeting for the annual election of officers, the reports from the President, Secretary and Treasurer, and the chairmen of the various committees were read, accepted and filed.

After a recess of ten minutes, the election of officers for the ensuing year took place, with the following result:

President, ROBERT E. COLLINS, 404 Market street; *Vice-President*, JOHN B. HOLMAN; *Secretary and Treasurer*, WALTER H. WILCOX; *Executive Committee*, ELIOT C. JEWETT, U. S. Assayer, Custom House, CHARLES M. ALEXANDER, ROBERT E. M. BAIN.

Upon motion of Mr. E. C. Jewett, a vote of thanks was tendered Mr. R. E. M. Bain, for his long and efficient services as President of the club.

On motion, adjourned.

After the meeting quite a number of slides, contributed by various members of the Club, were exhibited; the special features being views taken in Europe by Mr. Soldan and Mr. Butler, and views of the burning of an elevator and mill by Mr. Bain.

Committees appointed by President:
House Committee—C. H. BEGGS, 510 Pine Street; GEO. B. COMPTON, WESTERNE R. BASCOM. *Slide Committee*—H. B. ALEXANDER, St. Louis National Bank; W. M. BUTLER, A. P. ERKER. *Membership Committee*—C. M. MELCHER, 615 W. 4th Street; C. S. MOFFITT, H. Y. BLATTNER.

W. H. WILCOX,

*Secretary.***Bibliography.**

PRACTICAL PHOTO-MICROGRAPHY. By Andrew Pringle. New York: Scovill & Adams Company.

THIS is a handsome, large octavo volume of about 170 pages, finely printed and illustrated. Six fine plates of reproductions of photo-micrographs by the author serve to show how well he has mastered his subject. It is needless to comment on Mr. Pringle's skill as a photographer; his reputation is world-wide, and in the particular line of work undertaken here he shows the skill of a master hand with the microscope and camera combined. The book is essentially practical and should interest every lover of photo-micrography.

THE LIGHTING OF PHOTOGRAPHIC STUDIOS.

By P. C. Duchochois. New York: E. & H. T. Anthony & Co.

THE readers of the BULLETIN are too well acquainted with the work of Mr. Duchochois to need any recommendation of this book at our hands. An excellent series of articles from his pen upon the same subject appeared in our columns some time ago, and the present little volume is written in the same clear and earnest spirit that characterized those papers. By appealing to the old masters as models, and by carefully and forcibly showing the use and abuse of accessories, the author has produced a treatise that every true artist should read and study. Apply the precepts here set forth and it will be strange indeed if your work does not show the effect of your study.

The volume is a small one of about ninety pages, and will not tire the most busy artist in its perusal. We are glad that Mr. Ducho-

chois has found time to collect this material together in such good shape, and hope his reward will be commensurate with his earnestness.

JAHREBUCH FÜR PHOTOGRAPHIE UND REPRODUKTIONSTECHNIK FÜR DAS JAHR, 1890.
By Dr. J. M. Eder. Halle: a. S. Wilhelm Knapp.

This is the fourth issue of this excellent German Yearbook of Photography. That it is well stored with photographic material goes without saying, with such an editor as Dr. Eder. It contains about 400 pages of original reading matter, covering the whole range of the application of photography; and the twenty illustration plates give an excellent idea of the growth of the photo-mechanical printing processes. Every photographic reader of the German language should have this volume.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—C. S. McR. writes: Will you kindly tell me through the columns of the BULLETIN if it is necessary to use the "clearing solution" (acetic acid and water) when developing bromide paper with either hydroquinone or eikonogen? I have always supposed the acetic acid was only necessary to make the paper acid to prevent the iron precipitating?

A.—While the above supposition is entirely correct, and it is not *necessary* to use the clearing solution with either hydroquinone or eikonogen, it is still a safe and wise course to follow, particularly if the developer be dark colored.

Q.—J. R. M. asks: How can I restore, or blue, a faded or yellow photograph for copying? Also, can you give any remedy for silver stains on negatives, caused by damp, pimpled paper used by the proof printer? I have soaked them in weak cyanide solution, but it does not take them clean out.

A.—If mounted, remove from the mount, bleach with bichloride solution, containing equal quantities of bichloride and sal ammoniac, say 3 per cent. of each. Wash well and develop with hydroquinone or eikonogen

developer. This will not give you a quality equal to the original, but it will intensify the print. Replying to second question we would refer to an article on page 116 of the BULLETIN, February 22, 1890, Vol. xxi, No. 4, by Alexander Lainer, which, in paragraph 7, refers to this trouble. We would add, that the treatment here recommended is said to work nicely.

Q.—J. H. O. asks: Will you kindly tell me how to develop Stanley dry plates? I have had bad luck with them so far. I have used two dozen and opened the third box, and still no picture. As soon as the sky begins to show and before the other details can come up, out flashes the picture; it gets dark with nothing but the outline of the horizon. I have used the Stanley developer, and the pyro and ammonia developer; have used them strong as recommended, and have used them diluted; time exposures with small diaphragm and various exposures. The plates also seem all full of holes from the point of a pin to a pin head in size; and to hold them up to the light they look like a bright starry sky on a moonless night—holes all over the plate. I would also like to know if you have the address of Mr. Simpson, member of the Society of Amateur Photographers of New York?

A.—Follow directions accompanying Stanley developer, but first of all, reduce the time of exposure. From description your plates are much overtuned, which is easily understood when you consider that the plates referred to are among the quickest made. To avoid the holes in film, immerse in water and lightly rub the surface while immersed with the fingers, or better still, a camel's hair brush, before developing. Address care Society of Amateur Photographers, 122 West 36th street, New York.

Q.—D. H. writes: I believe many of your readers would be benefited by answers to the following questions: 1st. What bad effect, if any, is derived by leaving albumen prints in hypo bath five, ten or fifteen minutes too long? 2d. What bad effect, if any, by having hypo bath too strong, say one-third stronger than usually is employed? 3d. Why is it that paper not fumed enough will print measly when, with an extra thirty minutes fuming this effect will disappear? 4th. In directions for polishing burnisher, crocus cloth is recommended; no one seems to know what kind of cloth it is; it has been suggested that the "gunnie" or coffee rack was crocus cloth; is it so? 5th. Through mistake a dealer sent me Anthony's

daylight bromide paper; can I use it successfully with Cooper lantern; if so, how much more time shall I give it than the regular artificial light paper? I have had poor success with it so far. About how many seconds should I give it with a half size lens, full opening, with rather a quick printing negative? Is it possible to make a good lantern slide on an ordinary dry plate? What is the shortest time a correctly exposed plate, say Seed's 23 or Cramer's 40, should be in the developer to obtain the best negative, of course allowing that a stronger developer will develop it quicker than a weaker one? Do you think that any Mutual Benefit Association for photographers will protect against those who like to work cheaper than the usual rates?

A.—In regard to first question we would say that there is none whatever, if bath is clean. As to the second, there is a risk of the salt crystallizing in the paper after it is removed from the bath; otherwise none. Relative to number three, the effect is new to us; we would like to see some of the prints. Crocus cloth is of the character of emery cloth, but the surface consists of ignited oxide of iron, free from grit. It will take anywhere from fifteen to thirty seconds, with Cooper lantern, depending entirely on quality of negative used. One or two carefully timed trials will do more to demonstrate it than anything else. To make lantern slides as above, use plenty of bromide in developer. Time required in developer will depend entirely on the temperature of developer, its strength, and the nature of the subject. We cannot say further than this. We believe in no combination of this kind, because men will not keep faith with one another.

Views Caught with the Drop Shutter.

Dr. R. W. WILCOX, the son of Colonel V. M. Wilcox, the President of the house of our publishers, has recently been elected to a professorship in the New York Post-Graduate Medical School and Hospital, and thus occupies one of the three most important chairs in that institution. This is a flattering tribute to his earnest application to study "while in Europe and the minor departments of the college. He is doubly honored in this instance, as he is the youngest man who has ever risen to the dignity of this chair. We tender our compliments and best wishes for a long and prosperous occupancy.

Mr. HISLOP, of the London Camera Club, called upon the editors of the BULLETIN during his recent visit to New York, and was also entertained by the New York Camera Club, at their beautiful rooms on Fifth Avenue.

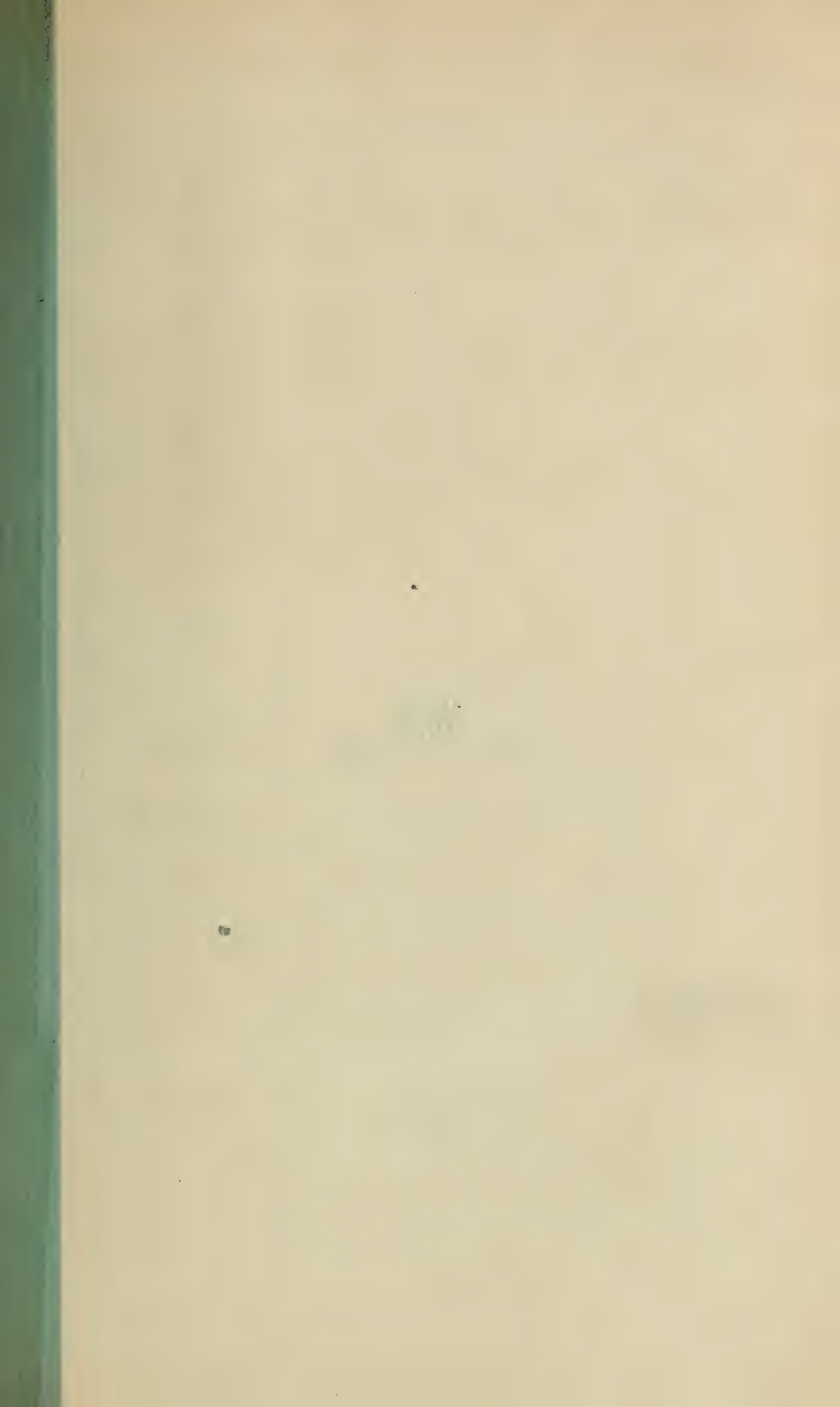
A VERY good adaptation of Mr. Rockwood's tessarograph, which appeared in a recent number of the BULLETIN, has reached us from the studio of Mr. D. C. PRATT, Aurora, Ill. Mr. PRATT writes us that the negatives were made with a common gem ferrotype box and four cheap lenses.

WE have received four interesting pictures from Mr. C. C. LYON, Jr., Brasse Terre, W. I., for which we are obliged.

OUR friend, Mr. RICHARD WALZL, of Baltimore, Md., comes to our remembrance again as we review the tenth edition of "The Photographers' Friend," which is just at hand. It is a finely printed, neatly bound pamphlet, of octavo size, containing 80 pages of matter, which is of interest to any one who has to buy photographic supplies.

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C. E. CONLY, PHOTO.

BOSTON, MASS.

STUDY.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

MAY 10, 1890.

Vol. XXI.—No. 9.

A NEW HELPER IN PHOTOGRAPHY—ACID-SULPHITE.

For some time past our German correspondents and exchanges have been speaking very highly of the merits of solution of sodium acid-sulphite as an addition to the fixing bath. As this special material was not obtainable in the United States, we induced the publishers of the BULLETIN to import a quantity of it, that American photographers might have an opportunity of looking into its action and merits. It is now upon the market, and we have been experimenting with it both in the fixing bath and also as a preservative for the several organic developers.

When pyrogallol was first used for dry plate development in conjunction with alkalis, several formulas were proposed using sulphite of sodium as a preservative agent. And it was found that the addition of sulphurous acid had a very beneficial effect. This acid was added directly, as such, in solution, or it was developed in the mixture of pyrogallol and sulphite of sodium by the subsequent addition of sulphuric acid, which caused the formation of a certain amount of sulphurous acid in the fluid, and at the expense of the sulphite of sodium. No matter which method was employed, the final result was the formation of a small quantity of acid-sulphite of sodium, which preserved the pyrogallol for a much longer period than when ordinary sulphite of sodium was used. But the trouble about these early efforts at preserving pyrogallol was that the quantity of acid-sulphite present was small compared with the amount of ordinary sulphite. We have now presented to us in a very convenient form a very strong solution of acid-sulphite of sodium, that in the compounding of developers will prove extremely useful. The material is in the form of a pale, yellowish fluid, smelling strongly of sulphurous oxide gas, with which it is saturated, and containing over fifty per cent. of acid-sulphite of sodium in solution. That is to say, it contains half its weight of acid-sulphite of sodium, while ordinary sulphite of sodium in crystals contains half its weight of normal or neutral sulphite of sodium. From the nature of the two salts the acid-sulphite solution contains therefore twice the amount of the preserving element, sulphurous oxide, which the ordinary sulphite crystals contain. This would be true if the ordinary sulphite crystals were pure, but it is next to impossible to make them so, for they usually contain from four to six per cent. of sulphate of sodium, and two or three per cent. of carbonate of sodium. The new acid-sulphite solution

contains a little sulphate of sodium, but the excess of sulphurous oxide gas with which the fluid is charged compensates for this.

Such is the new material placed in the hands of the photographer. Now a few words as to its uses.

The first important application of the new fluid is in the fixing bath. If to a quart of fixing bath (1 to 4) we add about 2 ounces of the acid-sulphite solution, the bath is rendered acid, but no change takes place otherwise. In this bath any negatives can be fixed, and with a rapidity and clearness that is really startling. Some of the slow varieties of plates are remarkably long in the ordinary bath before they are fixed nicely; but in the new acid-sulphite and hypo bath they fix in about one-fourth of the amount of time ordinarily taken. And what is yet more pleasant to note, they are remarkably clean and free from stain. In fact, they look exactly like plates developed with ferrous oxalate after they come out of the new bath, although they may be badly stained before fixing. The new fixing bath is beyond question the best remedy for stained plates from organic developers. One thing must certainly be remembered at all times, the fixing bath must be kept acid by the addition of new acid-sulphite solution from time to time in order to have it maintain its efficiency as a clearing bath. If the proper care is exercised, the use of the alum clearing bath can be entirely omitted when the new acid-sulphite solution is used; thus eliminating a step in the present negative process when clear, crisp and quick negatives are desired.

We must now say something about the application of the acid-sulphite to the developer. With pyrogallol the application is very simple; to every grain of pyro in solution add one drop of the acid-sulphite solution as a preservative. Thus, you may take

Pyrogallol	1 ounce.
Acid-sulphite.....	1 "
Water to make.....	10 ounces.

This solution contains five and a half grains of pyro to the fluid dram and will keep a long time. To develop: in one ounce of water use from one-half to one fluid dram of the above solution, with from one and a half to two fluid drams of alkaline solution, made as follows:

Sodium carbonate (crystals).....	5 ounces.
Water to make.....	10 "

In the case of eikonogen it works equally as well as with pyro. In this case the formula becomes:

Eikonogen (finely powdered).....	1 dram.
Acid-sulphite.....	1 " (fluid).
Water to make.....	10 ounces.

Dissolve the eikonogen first, then add the acid-sulphite. This solution contains three-quarters of a grain of eikonogen to the fluid dram, and keeps as well as the pyro mixture above. In developing, if sodium carbonate is used, to every ounce of the eikonogen solution add from one to two drams of the solution given above for pyro, and no water. If carbonate of potassium is preferred use one to two drams of the following solution:

Potassium carbonate (dry).....	3 ounces.
Water to make.....	10 "

In each case the negatives come up clear and full of detail, without any tendency to fogging. Judged by experience with the ordinary developers these

new mixtures with acid-sulphite work a little more quickly; and if the negatives are fixed in the acid-sulphite fixing bath, the results leave nothing to be desired as to quality.

With hydroquinone we have not yet obtained any desirable results, the mixtures tried working much too slowly to be of practical use.

As the developers given above work more rapidly than those ordinarily employed, care must be taken in regard to the light used in the dark room, that it is of the proper non-actinic quality. It is best to use as little light as possible under any circumstances, but always enough to see what you are doing.

We are sure that those who use the new acid-sulphite of sodium will find it a great help to the production of clean stainless negatives, closely resembling those of wet-plate days.

EDITORIAL NOTES.

At a recent exhibition given under the auspices of the Photographic Society of India, which was held in Calcutta, we are pleased to note that two of our own prominent amateurs bore off prizes, Mr. Robert S. Redfield, Secretary of the Photographic Society of Philadelphia, being awarded the silver medal, and Mr. Charles E. Pancoast, President of the Waterbury Camera Club, receiving honorable commendation.

Colonel A. C. M. PENNINGTON, of the United States Army, has sent us a beautiful specimen of his work, in the shape of a landscape study, with water and cattle. The print is a platinotype, and is to be commended for its composition and the striking effect of lights and shade. We are glad to add this to our collection, and thank the Colonel for his kind remembrance.

ANOTHER organic developer is said to have been discovered which is claimed to be of great value in the photographic world, and this time James H. Stebbins, Jr., President of Society of Amateur Photographers of New York, is the discoverer; who, by the way, suggested the possibility of the eikonogen, before it was published as a developer.

THE editors received a pleasant call recently from Messrs. George Bullock and John L. Stettinius, of Cincinnati, the former of whom is actively engaged in forming an interstate league of societies of amateur photographers, with a view to holding a convention for mutual organization and improvement. We are heartily in sympathy with the project and wish it every success.

S. C. SARGENT, of Taylor's Falls, Minn., has forwarded to the BULLETIN two very strong pictures of life in the logging camp, which, besides being extremely interesting, are excellent examples of photographic work; considering the fact that the views are of snow scenery and abound in heavy shadows as well. We consider them remarkably good.

THE Brooklyn Academy of Photography gave, at Association Hall, in Brooklyn, on the evening of 2d inst., a very interesting exhibition of slides made by its members, from negatives of the Washington Centennial of one year ago. The introductory address was made by the Rev. H. Price Collier, and abounded in

wit. The descriptive address was given by Mr. F. La Manna, who was also represented by several of the slides. Contributions were shown from the work of most of the members of the club, several of Messrs. Black, Hoagland, La Manna, Lawrence, Tremper and Winttingham being particularly good. The audience was large and appreciative.

THE Broadway window of Mr. F. Hegger, the well-known dealer in photographic works, has been filled for some days past with some unusually large photographs of Yosemite and Florida views, by Mr. Jackson, of Denver, Col. An autotype of the Matterhorn, 3 x 4 feet in size, from a negative made by Professor Donkin, who subsequently lost his life in the Caucasus, has also attracted much notice.

MISS CATHERINE WEED BARNES, the eminent lady photographer of Albany, has accepted a position on the editorial staff of the *American Amateur Photographer*. Miss Barnes is an enthusiastic and conscientious worker, whose skill is well known in photographic circles.

A LANTERN exhibition of views made by Hugh A. Smedberg and L. Bock, Jr., during a two weeks' trip last summer, was given in Hoboken last week to a large and well pleased audience. Many of the views shown were made from the platforms, and even the tops of moving trains, and the results were both interesting and unique.

A NEW addition to photographic literature appears under the title of the *Photographic Globe*, published in New York, and edited by Maximillian Toch. It is small octavo in size and neatly put together. We wish it success.

ANOTHER scheme for taking photographs in natural colors comes to us from our English exchanges, by which it appears that a blinding flash of lightning came just as an exposure was being made, the result showing the colors reproduced in the picture. Nothing more definite than this is known of the occurrence, however.

THE following remedy for flat and grayish platinotypes is recommended by Hans Lenhard, of Vienna: 125 grammes of pure gelatine are melted in 1,000 c.c. of water, and the whole gradually brought up to boiling point. After removing from the fire, add 125 grammes of pulverized alum and dissolve by stirring. Take of this solution one part and water two parts, pour into a flat dish, which should be kept warm by being set in another dish of warm water; immerse the platinotypes to be treated in this bath and allow to remain for some minutes, then transfer to a dish of cold water and dry between blotters. It will be found that this treatment will restore the vigorous appearance.

TOURIST photographers who desire to carry a large amount of highly concentrated developers on their trips will be interested in the methods advised by A. von Loehr. Four small bottles are required, the first of which should be filled with 100 c.c. of a concentrated solution of calcium bisulphite; the second with 100 c.c. of a solution of caustic soda, 1 to 10; in the third put 25 grammes of hydroquinone. The fourth should contain 10 c.c. of a solution of potassium bromide, 1 to 10. This quantity will develop about one hundred 4½ x 6½

plates. To develop: add to 100 c.c. of water 4 c.c. of calcium bisulphite from bottle No. 1, and dissolve in this 1 gramme of hydroquinone, from bottle No. 3. Make a second solution of 4 c.c. caustic soda solution, from bottle No. 2, diluted with 100 c.c. water. (The bromide solution in bottle No. 4 is to be used *ad lib.* as a restrainer.) The last two solutions will keep for a long time, and should be used in equal parts.

Nor long since the editors of *Liesegang's Photographisches Archiv*, in Dusseldorf, Germany, issued a circular letter to all prominent professional photographers throughout Germany asking information as to their several and individual methods of working, and among other questions the following:

1. What developer do you use in your portrait studio?
2. What special properties or qualifications do you claim for your developer?
3. Give combination of solutions used in cases of normal exposure?
4. Do you use a preliminary bath, and what of?

It was ascertained from replies to the above questions, that one-half of the whole number still adhere to the ferrous oxalate developer, the main reasons given being the simplicity, uniformity of action, cheapness, cleanliness, and freedom from fog. One quarter favor eikongen, 15 per cent. hydroquinone, and 10 per cent. pyro.

An interesting application has been made by Dr. Liesegang to the effect that a solution of chloride of magnesium may be employed for fixing prints on paper, instead of hyposulphite of soda, with the advantage of giving less change in the image, consequently requiring less gold for toning, and the important difference in amount of washing required to eliminate it, Dr. Liesegang even claiming that a print so fixed requires no washing. This statement is said to be confirmed by Dr. Miethe. The bath is composed of

Chloride of magnesium.....	15 grams.
Alum.....	2 "
Water.....	100 c.c.

With all due deference to these high authorities in regard to not washing the prints, we should think that they would want as much washing as in the case of hypo. Otherwise, owing to the deliquescent nature of the chloride the prints would be apt to absorb moisture, if a trace of the magnesium compound is left in them. And this attraction for dampness would produce mouldy prints very readily.

WE are glad to receive from our good friend, Mr. Fred. E. Ives, a series of photo-micrographs of excellent quality, including diatoms and examples from both the vegetable and animal kingdoms, as, for instance, a section of pampas grass, stem of clematis, proboscis of blow-fly, flea and bee-sting. We consider them to be excellent examples, and congratulate him on his success in this particular field of the application of photography.

THE Schenectady Camera Club, of Schenectady, N. Y., recently organized, meets on the first evening of the month at Meyer's Arcade. *President*, Professor M. L. PERKINS; *First Vice-President*, W. C. VROOMAN; *Second Vice-President*, J. L. CORNALL; *Treasurer*, W. H. PECKHAM; *Secretary*, W. E. UNDERHILL.

THE Camerads have just re-organized at New Brunswick, N. J., with the following officers: *President*, Professor P. T. AUSTIN; *Vice-President*, W. HORN; *Secretary and Treasurer*, Dr. HARVEY IREDELL. Regular meeting, every Thursday evening.

THE Oregon Camera Club has been merged into the Oregon Alpine Club, as the photo department of the same, with W. W. BRETHERTON, *President*; Otto SWITZENBERGER, *Vice-President*; E. NORTON, *Secretary and Treasurer*. The Oregon Alpine Club, in its original form, is the possessor of a fine library, and numbers about 500 members.

THE Amateur Photographic Society of Oregon, with its headquarters at Portland, was organized on April 8, 1890, with a charter membership of 21. The following officers were elected for the ensuing year: P. S. BATES, *President*; HUGO GOLDSMITH, *Vice-President*; S. J. KRAEMER, *Secretary*; E. B. BAKER, *Treasurer*. Quarters have been secured in the Ainsworth building, where a reception and dark-room have been fitted up with all modern appliances. The Society will be pleased to see any amateur photographer visiting their city, and those producing credentials from any other photographic society by applying to any of the foregoing named officers will be extended free use of dark room.

TRANSPARENCIES.

BY P. C. DUCHOCHOIS.

Most transparencies are made by professional photographers by the wet collodion process, these transparencies being preferred for projections on account of their sharpness and freedom from granulation.

The ordinary negative collodion answers quite well by diluting it with about one-fifth of its volume of ether and sensitizing in a 7 : 100 silver bath, but the image should be developed with a special developer in order to obtain clear shadows and good tones. This developer necessitates a lengthening somewhat of the time of exposure. It is compounded thus:

Ferrous sulphate.....	235 grains.
Sodium lactate.....	70 "
White sugar.....	100 "
Citric acid.....	5 to 10 "
Acetic acid No. 8.....	6 drams.
Alcohol.....	q. s.
Water.....	1 pint.

The proof should be fixed not with potassium cyanide, but by sodium thio-sulphate 1 : 8, to which may be added, to improve the color of the reduction, one-half part of ferrous sulphate dissolved in one-half of the water.

When necessary, the proofs are toned by auric or palladious chloride, or the following solution:

Platinic chloride.....	4 grains.
Mercuric chloride.....	2 "
Hydrochloric acid.....	5 minims.
Water.....	24 ounces.

The copying apparatus consists of a camera extending both ways, the lens (5 or 6 inches back focus) being placed in the middle. At the end fronting the

lens there is a frame provided with kits to hold the negatives, and at a distance of about 2 inches from it is adapted a ground glass, upon which the sun's light is reflected by a mirror.

When such a camera is not at hand the transparencies can be made by a simple arrangement devised by Mr. Blanquard: "There is a long plank upon which the camera stands; at a little distance in front of the lens stands an upright board with a perforation in which the negative is placed. Beyond the negative again is a white cardboard sloping at an angle of 45 degrees. The cardboard reflects the light through the negative, and before focusing a black cloth is simply thrown over the camera and over the upright board that carries the negative in order to shut out the light. This is the whole arrangement."*

The drawback of the wet collodion process is the long exposure required in cloudy weather. Professional photographers obviate it by lighting the negative with the oxyhydrogen or electric light.

The dry collodion process is employed to print by contact. The plates are prepared by the bath process, so called, or with an emulsion. The former process consists in coating and sensitizing the plate as usual, then washing out the free silver nitrate in excess, first in water slightly acidified with acetic acid, then in pure water, and flowing the film twice in opposite directions with a preservative made of

Gum arabic.....	10 grains.
Sugar candy.....	3 "
Tannic acid.....	10 "
Water.....	2 ounces (and filter).

To expose, place the dry plate on the negative in a pressure frame, and upon it lay a cushion of black velvet to prevent halation, press the whole into contact not too tightly (the plate may break), but sufficiently, however, to insure perfect contact. Now cover the frame with a black cloth and place it in a subdued daylight, or opposite the reflector of a petroleum or gas light, in such a manner that the rays of light fall perpendicularly on the negative, when, the black cloth being removed, the plate is exposed for five or six seconds in the former case, and from 50 to 60 seconds or more in the latter, depending on the intensity of the negative.

Gelatine plates are much too sensitive to be impressed by daylight; one exposes them by an artificial light at a regulated and always the same distance from the source of light, which being, so to speak, of a constant intensity, permits one to ascertain the exact time of exposure by one or two trials. A very convenient apparatus for this purpose is manufactured by the publishers of the BULLETIN.

The image impressed on dry collodion plates by the bath process may be developed either by silver pyrogallol or the alkaline method. The former method is preferred by the writer.

SILVER-PYROGALLOL DEVELOPER.

A. Pyrogallol.....	1½ grains.
Citric acid.....	2 "
Water	1 ounce.
B. Silver nitrate.....	1 grain.
Water	1 ounce.

* "The Studios of Europe," by H. Baden Pritchard, F.C.S. New York: E. & H. T. Anthony & Co.

Mix in equal parts. Soak the plate for a minute in water, rinse under the tap and proceed.

The formulas for the alkaline developer will be given further on.

The collodion emulsion is prepared as follows:

Dissolve 80 grains of silver nitrate in 2 ounces of alcohol and 30 minims of water by the aid of heat, add 30 grains of pyroxyline, 1 ounce of ether, and mix. Then (in the dark, of course) add the following collodion by small quantities, shaking violently after each addition:

Zinc bromide.....	50 grains.
Pyroxyline.....	10 "
Ether.....	2 ounces.
Alcohol.....	6 drams.

Allow to ripen for ten hours, then add 5 minims of hydrochloric acid, and in eight hours the emulsion is ready for use. It is quite sensitive, and may be used in the camera. For transparencies it yields clearer pictures than gelatine emulsion, and is less troublesome to work with.

As in every collodion process, the plate should be prepared with a substratum to hold the collodion film. We use

White of one egg, or.....	1 ounce.
Aqueous ammonia.....	10 minims.
Water.....	8 ounces.

When coated with the emulsion the plate is immersed, until greasiness has disappeared, in a preservative consisting of

Old ale, stale, not acid.....	1 ounce.
Pyrogallol.....	1 grain.

Transparencies, whatever be the process selected, do not admit of under-exposure.

ALKALINE DEVELOPER.

A. Sodium carbonate.....	25 grains.
Ammonium bromide*.....	2 "
Water.....	1 ounce.
B. Sodium sulphite.....	50 grains.
Sulphuric acid.....	2 drops.
Pyrogallol.....	12 grains.
Water.....	1 ounce.

To develop, wash the plate under the tap, mix 1 dram of B to A and proceed. When the details are visible increase the dose of B by 1 or 2 drams, to obtain intensity. If the image develop too uniformly, wash the film, neutralize with dilute acetic acid, and continue the development with silver pyrogallol.

(To be continued.)

THE SALTING AND EXCITING OF DRAWING AND OTHER COMMERCIAL PAPERS.

BY LYONEL CLARK.

(Continued from page 119.)

Such a bath will, of course, be prepared by simply dissolving the amount of silver in the purest water obtainable. Pure water is not absolutely necessary, but it is advisable, as any impurities in it will destroy so much silver. The nitrate of silver bath itself needs no protection from light; indeed, in some cases it is advisable to expose it to the brightest sunshine. I must refer my readers to

* For gelatine plates the proportion of bromide should be half less.

the numerous handbooks for the best methods of preserving or rectifying a disordered silver bath. For my own part, I do not consider a bath to be a necessity, at least, not for an amateur who only prepares at most small quantities of paper. I myself make up my silver solution as I require it, and do not float the prints on a bath in the usual way, but brush the silver over the face of the paper with a special kind of brush. And I should advise amateurs to avoid the large initial cost of an exciting bath and the somewhat troublesome manipulations it requires, and follow the plan I have myself found perfectly efficacious.

The operations of sizing and salting the papers, it is needless to say, will have been carried out in any ordinary room, as the action of light does not affect the papers in the least, nor does time, so that any quantity of paper can be prepared and stocked. But the operation of sensitizing or exciting can only be carried on in a suitable locale; perhaps nothing is better than a room lighted by a good paraffine lamp or gas light, but at the same time a certain amount even of daylight, during the operation of coating the paper, will do no harm, although, during the drying of the paper, this should be excluded. To give an idea of the amount of light the paper will stand, I may say, then, that any ordinary room with the blinds down will do no harm. My own practice is to coat my paper as I require it in the dark-room, and dry it there over a paraffine stove in one corner where the white daylight does not fall directly, and I have never experienced any loss from light struck paper. Under these conditions I find that, in ordinary weather, it is perfectly practicable to sensitize and dry the paper and have it in the printing frame within fifteen minutes.

The operation of coating is of the simplest—say we are using a sheet of paper $13\frac{1}{2} \times 10$ (the eighth part of a sheet of double elephant). Lay it face downwards on a board, and place a sheet of glass, 12×10 , over it, and double over the two overlapping ends. The sheet of glass and paper is then turned over and laid on the board, the ends, tucked in under the glass, keeping the paper from shifting. I then pour about two drams of the silver solution on to one end of the paper, and with this modified Blanchard brush, spread it rapidly and evenly over the surface of the paper. Care must, of course, be taken to see that every part of the paper is covered with nitrate, moreover we must not forget to leave an excess of it. When we look on the coated paper by reflected light, the whole surface ought to glisten with an excess of the liquid, and I like to see, when the paper is hung up to dry, a few drops trickle off. I know of no failure more likely to happen than that of an insufficiency of nitrate having been applied. With the strong salting baths I recommend, there will be found a tendency for the nitrate to be all converted into chloride, in some plates at least, though it may still be in excess in others; and the print, on exposure, will show patches of great intensity, surrounded by regions where the image is of a pale bluish color. The examples I hand round show this fault, which generally arises from a desire, by lessening the quantity brushed on, to economize silver.

I do not, however, recommend twice sensitizing the paper, although no less an authority than Mr. Burton has done so in a very recent paper of his on sensitizing rough drawing-papers. I think, however, that I can point out the reason of the discrepancy between us. Burton recommends the soaking of the prints in the sizing solution. If this be done, then I freely admit that double exciting will be necessary, or it will be impossible to apply enough nitrate to compensate

for the very large quantity of chloride and organic size that will be in the very texture of the paper.

I cannot, however, agree with Burton in recommending the soaking of the paper; the operation is perhaps easier and quicker, but I feel sure that the majority of the silver formed is simply wasted—never even being affected by the light; and therefore, on the score of economy of time and money alone, I prefer my system of floating heavy drawing papers; and I am sure the many examples I hand round, produced in that way, will show that a success can be obtained, even with a single application of a sensitizer.

The brush I employ for applying the solution is in reality a Blanchard brush that I have slightly modified to suit my tastes. I found the ordinary form hardly rigid enough, and therefore I now strengthen the swan's-down calico by a sheet of celluloid. The celluloid is laid down on the swan's-down, and the two together doubled without making a crease, and the two ends nipped between two pieces of wood or glass, sprung together by an India rubber band. The swan's-down gives it softness, the celluloid springiness, and the wood forms a handle. An illustration of this brush will be found in a little work of mine, just published at the office of *The Amateur Photographer*, called "Platinum Toning," where very full directions for the preparation of silver paper are given.

Now, paper sensitized with nitrate of silver differs largely from simply salted paper; the latter will keep indefinitely, but the former, when in its most sensitive condition, if left lying about or exposed to the atmosphere, will hardly keep in summer time to the following day, and not much longer in winter. If packed between sheets of blotting-paper, saturated with soda carbonate, it will keep a week or two, especially if kept under pressure, but at a slight loss of sensitiveness. It is undoubtedly the free nitrate of silver that is the cause of this destruction or discoloration of the paper; this is easily proved by the fact that if we wash sensitized paper, and so free it from the nitrate, it will keep very well; but unfortunately it will then have lost all its printing power, and it will only be by resorting to ammonia fuming that we can obtain a vigorous image. But it is possible to convert the free nitrate into other salts which will have the power of keeping perfectly well—for instance, the citrate of silver. This organic salt of silver also replaces the nitrate very well as a printing salt, and paper prepared with it is fairly rapid, tending to give images of a very red color, characteristic of the organic salts. It is highly probable that the commercial brands of paper are preserved somewhat in this way, the back of the paper being floated on a bath of citric acid, and the same plan may be used; but if moderate powers of keeping only are required, the citric acid can be added at once to the silver nitrate in the following proportions, thus saving the extra manipulation:

Nitrate of silver.....	60 grains.
Citric acid (crystals).....	25 "
Water distilled.....	1 ounce.

This bath keeps perfectly, but should not be exposed to daylight, as the organic silver salts are affected by light.

The mode of application is exactly the same as for the ordinary nitrate bath; that is to say, it is brushed on. With some brands of papers, however, it will be found to be too acid, and when applied to the paper will sink into the texture, giving the paper a translucent aspect. In such a case the quantity of citric acid may be lessened until the effect ceases to be apparent; with papers sized

with gelatine, this is less likely to happen than if they be sized with arrow-root.

Paper thus prepared is very suitable for summer work, but in late autumn, when the light begins to get feeble, I usually revert to another form of sensitizing bath, which is more easily affected by feeble light. This is the ammonio-nitrate bath, full directions for preparing which will be found in my last paper on "Platinum Toning" (*Camera Club Journal*, November, 1889), and it is a bath I can strongly recommend where vigorous results are sought for.

When the light is so feeble that all ordinary printing-out methods fail, we may then resort to a development process, samples of which I hand round. Paper salted in the ordinary way may be used for this process, and we shall be able to obtain prints even on the dullest day, with about ten minutes' exposure:

The sensitizing bath is composed as follows:

Nitrate of silver.....	30 grains.
Glacial acetic acid.....	30 minims.
Distilled water up to.....	1 ounce.

This bath is also applied by brushing, and when dry the paper is exposed till the faint details of the image are seen; the appearance of the print should, in fact, resemble a properly-printed platinotype—all detail and no intensity. The print is developed on a saturated solution of gallic acid, to which, if over-exposure be feared, a few drops of glacial acetic acid may be added. The prints behave very much as bromide papers do—if they are under-exposed they come up hard and chalky, if over, flat and gray; but when correctly timed, they are, after fixing, of a very agreeable dark slate color, and require no toning. If it be wished they can, however, be toned, my acid platinum process being the most suitable that I have found for the purpose.

Although the above process is of the highest utility in winter-time, I cannot too much recommend it, at least not for prints on rough drawing-paper. The rugosities of the paper appear to have a mechanical action on the silver, which tends to be reduced more rapidly on these spots and causes great granularity and unevenness. With the not and H.P. varieties of drawing-papers it does exceedingly well, and gives some very beautiful results.

I have also experimented with a printing-out process, on the same lines, but in which the proto-sulphate of iron is the developing agent. I show one example of this; its developing action is very energetic, and as yet I can hardly claim to have it under control, but I should think an extremely rapid process might be worked on these lines.

I have now to introduce to your notice somewhat of a novelty, and that is a system of intensifying paper prints. During the atrocious weather of the last fortnight I have continually found that at nightfall, which has generally taken place about mid-day, I had prints still in the frames that were underdone. When I examined these half-finished prints, I found that all the detail was there; it was simply intensity or depth of coloring they lacked; some were almost completely finished, others were but very faintly outlined, but still, if the negative were good, all the detail was there, faint, but still visible.

It at once struck me that any process of intensification would save all these prints. Of course, by means of mercury or uranium I knew it would be quite practicable to intensify them; but I did not wish to introduce fresh chemicals into the image, but rather to have it formed as nearly as possible under the

same conditions as if it were printed right out. In other words, I wished to grow, to adopt an electro-plating term, a silver image on the skeleton already formed by the action of light.

I turned my attention therefore to the old system of silver intensification used with the collodion wet plates. I am not as yet in a position to give definite working formulas, but the several examples I hand round will, I think, show the very great possibilities of the process. As you can see for yourselves, it is possible to obtain the most beautiful tints, of a peculiarly rich brown color, and these without any subsequent toning. At the same time, it has the advantage that we are not bound to print to any particular depth, providing only all details are there; for this process cannot create (at least only slightly), but only intensifies. You can take the print out of the frame when you will. If nearly done, it requires but slight strengthening; if, on the other hand, the image is only faintly shown, the operation must be more energetic. Even after the prints have been toned, I find that they can equally well be strengthened to any desired point, should they have lost too much in the toning bath. These two examples were toned by double proto-chloride of palladium and sodium ($\text{PdCl}_2 \cdot 2\text{NaCl}$); the salt reduced their intensity considerably, but by my intensification process, they were brought up to their present vigor.

Prints thus intensified, although naturally of a very pleasing color, can, if it be wished, be further toned by any of the ordinary processes; my acid platinum process, for instance, gives prints of the greatest vigor and blackness imaginable.

I have here two prints taken from the printing-frame to day; one is only very slightly visible, the other is about three parts done. I shall now proceed to intensify these before you, and endeavor to so manipulate them, that the one that is now the feeblest shall become the strongest and most intense. These prints were produced by the citrate of silver process I have described above. I cannot say whether paper prepared with plain nitrate would answer as well; I think not. At any rate, if the prints be in any way alkaline, I find it is impossible to manipulate them. For instance, prints prepared on the ammonio-nitrate bath are instantly blackened all over on the application of the pyro, and it is essential, if clean results be sought for, that all the solutions as well as the print be distinctly acid. I need hardly point out that the process must be carried on by gas or artificial light, and not by day-light, or the purity of the whites will be destroyed.

I will first take the fainter print, and after soaking it in water, I pour over it some of the citrate of silver sensitizing bath. When this has flowed all over the print, I pour on a solution of pyrogallol, strongly acidified with acetic acid. You will notice that the print soon begins to darken, the vigor rapidly increasing. Before it has reached the desired intensity the solution should be poured off, and the print rinsed with a fairly strong acid solution; this will, to a considerable extent, stop further action, but there is a great tendency for the action to continue if not well washed. At this point, if it is to be toned with my platinum process, the solution can be at once applied, but if alkaline gold toning be used, it must be well washed first to free it from all acidity. No alkali should be added to the print until all the intensifying solutions have been thoroughly removed, or bad stains and general discoloration will result. (The stronger print was then intensified by Mr. Clark, the action being, however, stopped when a moderate intensification had been effected, so that in the end it was much less vigorous than the first print intensified.)

I am afraid that at present I can give you no further working details of the process than the above, nor can I say if it is applicable to the commercial ready-sensitized papers. As far as I know at present, I think that the resulting color depends on the amount of pyro used, but am not sure of this point. I shall, of course, work out the process more fully, and make known my results when the time comes. At present I must leave you to judge, from the few first samples produced, of the capabilities of the process, which will, I venture to think, be found a boon to the amateur.

I think I have now described all the different manipulations that are proper to the preparation of sensitized papers. The operations of toning and fixing are of the same character as those employed with ordinary printing papers. Any toning bath that gives the worker good results with commercial papers will give him better results with the paper he prepares himself. It must be remembered, however, that mat-papers tone more readily than albumenized papers, and therefore the toning bath should be diluted with as much again water. With the heavy varieties of paper, however, this is not necessary, as they have a distinct tendency to tone more slowly than thin papers. My own platinum toning process is most suitable, as the many examples I hand round will, I venture to think, prove.

I will not conclude, however, without pointing out that the washing and fixing of these heavy papers require to be much more thorough and prolonged than when thin paper is used. I invariably myself pass the prints through a second fresh bath of hypo after they have been at least ten minutes in the ordinary bath, so as to insure the hyposulphite of silver being dissolved. A pretty thorough squeegeeing between the changes of water insures the soluble salts being removed, and the resulting prints may, I think, hope for a very fair amount of permanency.

There must be several points on which I have not touched to-night, and about which, perhaps, some of you may be desirous of obtaining information. I can only say that I shall be most happy to answer, to the best of my ability, any questions you may put. I feel very strongly on the subject of home-prepared printing papers, and in coming before you to-night and advocating their revival I feel like a second Peter the Hermit raising the standard of a fresh crusade with the object of rescuing the charming art of silver printing from the hands of the Saracenic dealers. May I hope that I have chosen a propitious spot for the unfurling of my ensign, and that I have done rightly in addressing myself to the Camera Club, where the seed that I have sown will fall on good ground, and in due time will bring forth its harvest of artistic work to enhance the beauty of our exhibitions and lift our craft another rung up the ladder of art.

(To be continued.)

BLISTERS.

BY J. H. EULASS.

I FREQUENTLY see in the BULLETIN complaints of blisters. Now, I have no "specific" for blisters, but am never troubled with them, and have not been since using the following formulas, which are the most simple as well as most satisfactory I have been able to gather in twenty years' experience, and if you see fit to publish them, it may help some blister-plagued brother as it has me.

I use a plain silver bath, 55 to 60 grains, made slightly alkaline with bicarbonate of soda or aqua ammonia, float two minutes, having damped my paper, draw the paper off over a glass rod, then blot and dry, fume twenty-five to thirty minutes. Print for brown or sepia tones but little darker than I want my finished prints, as the toning bath bleaches but little. Stock, gold 1 grain to the ounce to tone, say seventy-five cabinets, take ice water 1 quart, gold solution $2\frac{1}{2}$ ounces, neutralized with saturated solution bicarbonate of soda or borax. Have the toning bath neither cold nor warm, but just comfortable to the hands; a small pinch of salt may be added to the toning bath where brown tones are desired, but do not "red" your pictures with either salt or acetic acid; wash them thoroughly in two waters, then put plenty of water on them to tone from. Tone until the red is just off for brown or sepia tones. They will "red" some in the hypo, but will dry all right. Print and tone a little darker for darker tones. Put them out of the toning bath in about two quarts of water in which you have dissolved a handful of salt, then fix eighteen to twenty minutes in the fixing bath: Saturated solution hypo, 8 ounces; water, 64 ounces; aqua ammonia, 1 dram. I use ammonia previously used for fuming my paper, so there is no loss in using it for your fixing bath. Put your pictures out of the fixing bath in a weak solution of salt, if you like; it is, however, immaterial whether you use salt after fixing or not; use the fixing bath as above and you will have no blisters. Any other silver bath may answer as well as the one given above, but don't use an acid bath.

The above toning bath may be used over and over again by pouring off the clear solution and adding the above amount of gold.

To get a nice finish on your pictures, mount and dry thoroughly; lubricate with white castile soap, 3 grains; alcohol, 3 ounces; let this dry well, then spot. Now, have your burnisher very hot, and pass your pictures through about four times very slowly, being careful not to let them stop. Convex them a little. Have your fixing bath and all wash waters all in temperature comfortable to the hands, and use "hard" water after fixing, if convenient.

MASON CITY, ILL.

MAKING DOUBLE PICTURES OF A PERSON ON THE SAME PLATE.

BY C. B. TALBOT.

IN reply to a query made some time ago, I send a description of a device I have used in wet plate days; the same could also be used for dry plates, I should think, with equal success. It is amusing to see a man playing chess with himself, while his sister or wife looks over his shoulder in each case, or some other person is brought in her place in the second case. Of course there is no end to the paradox, and it becomes the source of much amusement.

To do this, we take any ordinary camera and fit in the body next the plate-holder a small frame, one-fourth of an inch thick, with an opening in it as large as the full size of the plate to be used. We then make two small doors to it out of sheet zinc or wood, taking care that the doors shall overlap each other in the center, the hinges being at the sides. The overlap is an important matter, as it regulates the deception in an imperfect or complete manner, as it is improperly or correctly made. The proper overlap can only be ascertained by trial in the camera, and depends on the distance the doors may be from the plate in front

of it. The doors should be about three-eighths of an inch away, and they should be as thin as possible where they meet and overlies each other, so that where one or the other is opened the edges will be nearly in the same position as its mate. If these overlap too much a black stripe will be left, if too little an over dense or white one results. Hence the experiment must be made only in the camera, and the edges of the doors trimmed until they are just right, when the double picture cannot be distinguished from one made at one sitting, provided the time of each exposure was the same in each case.

To fully carry out the above, some means must exist for opening and closing the doors, as only one is used at a time. It is strictly necessary that each door should be provided with a small spring to keep it shut when the cord opening it is released. These may be of spring wire, coiled, or a small India rubber band, fastened so as to keep it shut; the cord from each door passing across the bottom of the camera and out through the bottom of the front frame near the lens board, the cord holes being made in vertical manner, to prevent the light passing in at the holes. The cords should fit the holes well, but should be readily pulled back by the springs on the doors when the cord is released. The cords must be long enough to reach some portion of the camera stand, where they can be secured. Instead of two doors, three, four, five or more doors may be made opening in different parts of the picture and of any shape desired, as they need not be rectangular or parallel by any means.

To use the device with two doors we proceed in this way: Place the chess-player and his sister before the table and chess-board, say facing the back-ground. Having drawn the cord connected with the door on that side of the plate, we secure it to keep the door open; now uncap the lens and expose; recap lens, release the cord and close the first door. We now take the figures from the front and place them behind the table, on the back-ground side, and add another charming young lady, who is also master of the game, at the end of the table. When all is ready we open door number two, leaving door one shut, fasten number two, open in the same way as we did with number one. We now uncap and expose a second time, when that portion of the mystery is ended. We now develop and find five persons on the plate, four of whom are the same or duplicates of themselves, and one new one added. Of the number of figures even two doors allow no one may conjecture, and when once well furnished with the door attachment described, there is no end to results. More doors would only be needed where the composition would require a different form, or the introduction of ghosts, dream pictures and the like, according to the fancies of the joker in the dark room. For a heavenly vision of Jacob's ladder, the angels may ascend and descend on the ladder, while the old patriarch sleeps on the stone. In this case we would expose the patriarch twice, and have two or three of the angels stand about him, while we opened both doors in the second exposure for the short second time on the white garments. The doors in this case open horizontally, the bottom one twice and the upper one once.

A PLEA FOR AMMONIA.

BY F. KNAPP.

THERE are a great variety of opinions as to what constitutes a good negative, that is, one that will give the best print. The positive is a proof of the negative, and by that we must regard the quality of the negative, good or bad, always

providing that the print is as good as the negative will make. There seems to be a tendency toward the bluish clear negative developed with plenty of sulphite. For myself, I prefer the negative to have a trace of yellow, such as we get with the ammonia developer, which is my favorite when the plate is adapted to it. Such a negative may not look so nice, but it will give a crisp, brilliant print with great delicacy. This negative should be made much thinner than the blue one, which must be made quite thick in developing. This fills up the details in the whites and makes a white chalky print. Compare a negative developed with ammonia with one developed with soda—both of the same subject, and also the positive, and (if such is made by one familiar with the developers) the one developed with ammonia will give the best print.

This I say from a practical knowledge: the best negatives I ever saw were developed with ammonia, being full of rich delicacy and half-tone, yet have clear, bright high lights, and print very quickly. The method is very old, having two developers—one normal and the other containing an excess of bromide of potassium.

Develop in first until detail is well out, then transfer to second, containing bromide, which will simply increase high lights. This is an old method, and many are yet using it,

This is the formula :

No. 1.

Pyro	1 ounce.
Water	12 ounces.

No. 2.

Ammonia	1 ounce.
Bromide potassium	120 grains.
Water	12 ounces.

To develop take $\frac{1}{2}$ ounce each to 10 ounces water.

BLISTERS ONCE MORE.

BY J. R. SWAIN.

I HOPE P. Ersly will pardon me for criticising his article on blisters in the BULLETIN of April 12th. He says he has been trying for the last ten years to find a paper that would blister under his treatment. Well, if he will come to the Wabash Valley and practice the art, he will soon be trying to find a paper that will not blister, especially after losing at least one-half of every batch for a week or two at a time, not by small ones, but by good big overgrown fellows that come to stay, whether they are welcome or not. If ever a poor photographer needs the blessings of St. Peter, it is then. It may be that the climate of Texas is not congenial to them, but in Indiana every photographer is more or less troubled with them.

He claims to be able to produce blisters at will by simply fixing one-half of a print in a strong bath, the other half in a weak one; the strong bath producing blisters, the weak one exempt. I gave the weak bath a thorough trial, and still some blisters. I want to say, however, that most of his directions are very good and well worthy of a fair trial, but some of his assertions are a little too strong. By using plenty of ammonia, say 1 ounce to the gallon, in the wash water between toning and fixing and in the fixing bath, also in the first water after

fixing, blisters can be kept under control, but not entirely prevented. Salt also seems to aid in the prevention of blisters, provided enough is added to the wash water to bear up a goose egg instead of a pinch.

I am thoroughly convinced that climate has something to do in causing blisters, and hard water seems to augment the disease. The subject is well worthy a friendly discussion.

DANA, Ind., April, 1890.

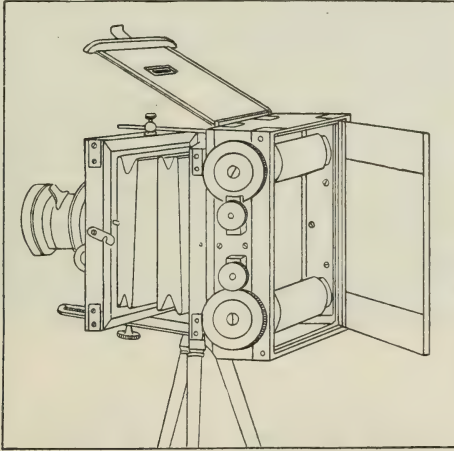
AN EARLY ROLL-HOLDER.

THE following extract from the *British Journal of Photography*, for June, 1875, is interesting in connection with the recent developments of the roll-holder :

We are never satisfied with what we possess ; and this spring, waiting for longer and brighter summer days, and planning my new excursions, the thought of carrying in my pocket a Howard's tent, and prospect of plunging my head into that tent for changing each plate after the exposure, looked to me an unbearable torture. For consolation I retired to my work room and, after some time, succeeded in preparing the slide which is intended to remove the last impediment in my way.

DARK SLIDE.

The principal components of the new dark slide (of which a diagram is given in the adjoining column) are two rollers on which the sensitive film, with its supporting paper or without, is wound, and there is room enough for one hundred plates. A darkened glass plate is fixed in front, in the place corresponding with the focusing surface ; this glass plate guides the sensitive film in the progress from one roller to the other, and secures its proper position. Each



roller has a metallic head by which it can be put in motion. By means of these heads all the ribbon of sensitive film can be consecutively drawn from one roller, and, after exposure, re-wound on another roller. But to secure perfect flatness there is attached to each head a pressing screw, that arrangement permitting the stretching of the film when in position. Before the sensitive ribbon is attached to the roller it is divided into sections corresponding with the size of the plates by black lines drawn in pencil, or otherwise, and each section is numbered.

In the sliding shutter is a little window secured with orange glass and spring metallic shutter. Through the orange glass I am able to observe the black lines forming the divisions between the plates and corresponding numbers. This permits me to judge of the proper position of each consecutive plate, tells me which plate is to be exposed, and, if any imperfection be observable, which plate to avoid.

The production of negatives in the field with the aid of these improvements is a real enjoyment, because all the hard work is removed, and numerous advantages are gained over the old system. The bulk and weight of plates and apparatus are diminished. Chance of breakage there is none; the chance of abrading the sensitive surface is diminished. I ascribe to the flexibility of the support the greater amount of resistance to rough treatment my film offers.

Blurring is impossible. In its application to the panoramic camera, what can offer facilities similar to the new film? All costly cylindrical plates and special printing frames are needless; the sensitive film may be made to take any shape in the dark slide, but will be flat in the printing frame.

For printing in carbon, and for all processes requiring reversed negatives, the film negative is ready without preparation. For printing stereoscopic negatives transposition is easy. For storing negatives no room, no boxes, or shelves are necessary. Film negatives are not destroyed by atmospheric influences.

Lastly, who can, with the glass system, when going to distant lands, dream of taking one thousand plates for this long excursion? But with my film that number, or one still larger, would not increase the weight of the traveler's luggage more than by a few ounces, and by a few inches the space occupied.

When I look to the future the circle of the beneficial effect still widens. The pliability of the sensitive film can alter the optical conditions of our apparatus. Our lenses will be smaller, definition more perfect, distortion, spherical aberration and other optical imperfections diminished; the aperture increased, and consequently the exposure shortened.

I conclude with another less important improvement. I do not like the black cloth we use to cover the head when focusing. It gives a mysterious appearance to the operator and increases the curiosity of the passers-by. Very often it conspires with the wind, without any respect for the head-dress of the operator or the stability of the camera. In my apparatus I substitute a looking-glass inclined 45 degrees to the ground glass. The image appears in the right position, is much brighter, and when shut, the frame containing the mirror offers a protection to the ground glass, taking infinitely less room than the black cloth.

LEON WARNERKE.

[From *Photographische Nachrichten*.]

HALOS AND HOW TO AVOID THEM.

BY F. STOLZE.

THE frequently repeated warning to the photographic fraternity to avoid the halo of negatives by covering the glass plates with a suitable light-absorbing medium, is still generally disregarded. The reason for this is, in all probability, that the halo so peculiar in its appearance is seldom fully discernible, and is generally considered synonymous with solarization, although it has no relation whatever with the latter. It seems to me, therefore, of the greatest importance to explain to photographers, clearly and distinctly, the origin of the halos, how

they look in their pure state, and how they can be produced or avoided. For this purpose there are no photographic preparations needed; the appearance is purely physical, and can be demonstrated, as will be shown by the following, in the form of a lecture, with simple means and to a large audience.

The condition of a dry plate, aside from the chemical process in the film by exposure, is optically the same as that of any semi-transparent thin film resting directly upon a proportionately pretty thick transparent plate. If the purely physical process is, therefore, to be investigated, it is best to produce a combination of this kind, which is chemically unchangeable in light. For this purpose a glass plate is coated with a mixture consisting of thin collodion and negative varnish, producing, when dry, a film of milky or porcelain-like appearance; or a thin porcelain glass may even be of service, which is brought into optical contact. The latter way, on account of the chemical indifference of the materials, gives the purest physical results. The experiment is made in the following manner:

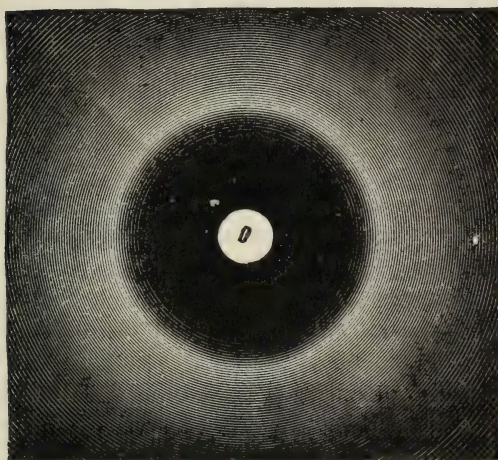
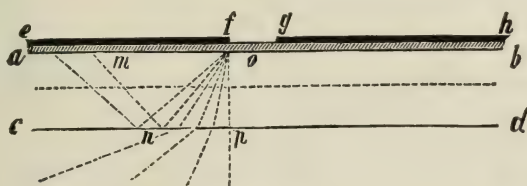


FIG. 1.

On a thin plate of porcelain glass, ab , is pasted a sheet of black paper, $efgh$, into which has been cut a small circular opening of about 5 m.m. diameter. If a very intense light source, preferably magnesium ribbon, is now brought behind this opening in a dark room, with the porcelain glass in vertical position, a weak, indistinct picture of the opening, fg , will show on the unpasted side of the glass, growing fainter toward the outside and extending in proportion to the thickness of the porcelain glass. A similar proceeding—the so-called irradiation—takes place with every photographic film, whether it consists of collodion or gelatine; but it becomes, however, less apparent on account of the thinness of the film, that of gelatine emulsion being at most 0.05 m.m., while that of collodion is even much less. The porcelain glass, on the

contrary, shows at no time anything else but this regular phenomenon, and it will never condense to a luminous circle at a distance from the circular center.

If a heavy plate-glass, $abcd$, having five to ten times the thickness of the porcelain glass, is now brought in optical contact with the porcelain glass by putting a few drops of glycerine between both and pressing them together, the result will be different: one will see, as before, on the other side of the porcelain glass the indistinct picture of the circle when the light source is brought behind the opening, fg ; but it is now, at about the distance, om , surrounded by a luminous circle, growing fainter gradually toward the outside, while its course toward the inside is very short, being equal in width to about the opening, fg . If the plate-glass is only half as thick, as designated by the dotted line, the diameter of the luminous circle is exactly only half as large. As to the shape of the circle, it is indifferent whether the rays of the light source fall vertically or diagonally upon the surface, fg . In the former case the picture of the whole appearance is only more brilliant and full of contrast.

Below the section $ehdc$ there is illustrated, in Fig. 1, the shape that the luminous circle has for the dimensions of the section. The middle picture, o , is drawn with sharp outline, as it appears with very small thickness of the film, $ehba$, to illustrate that in this case also the luminous circle becomes fainter toward the outside, according to the width of fg . It can easily be shown that all of this has to be so. In the section the dotted lines designate the course of the light rays which enter the plate-glass from the edge of the opening. The vertical ray, op , passes the surface without interruption, but the more diagonal the rays become the nearer they will approach the surface, ch , when passing out of the same until a point has been reached—about, if on angle, nop , equal to 41 degrees, where the escaping ray would have to touch the line, nc . From this moment no passage of the light rays from the glass takes place any more, but the rays are reflected at the same angle from the surface, cd —totally reflected—and strike, therefore, beginning from the point, m , the surface, ma , forming in such a manner the halo. It might appear now that this had to be sharply outlined at m toward the inside. But so far we have observed only one point, at f , of the luminous circle. If we look now at the opposite one at g , we will find that it emits exactly such rays as at f , only that all have been moved toward the right, the distance of fg . The same is of course the ruling for all points between f and g , so that the halo has always a diminishing width toward the inside, which is equal to the diameter of the luminous opening. One can see now clearly why, under ordinary conditions, the halos become only very seldom and exceptionally visible in the form of a luminous circle. If the luminous surface, fg , is so wide that it is more than double the thickness of the glass, op , the halo will appear with its most intense part in the luminous surface, and the dark separating space will disappear. This takes place where the halo is generally most disturbing against lighted windows in interiors and in the open air, where the sky stands out against a dark landscape.

But it can now also be seen in what way the halo can be avoided. The principal thing is, to remove the total reflection at the glass surface, cd . This, as we have seen, determines that the light rays, by their passage from the glass to the air, are brought near to the glass surface in quite a determined proportion. If this surface is now coated with a film, which optically has about the same density as the glass, the light rays pass over to this film at every angle without

any reflection. Thus nothing would be gained, as the total reflection takes place now where the new film and air meet. But if this film is covered with a material which absorbs the photographically active rays, for instance with aurin, they are, so to speak, filtered out of the totally reflected rays, and only the indifferent rays reach the sensitive surface. Two things result from this. As the rays have to pass the colored film before and after reflection, they are doubly reduced. For color sensitive plates the covering has to be much more intense.

One can easily convince himself now about the action of collodion containing castor oil. If a plate is flowed with this, and the loop bars of a window are

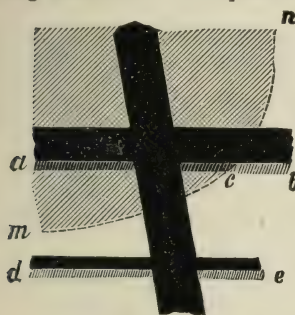


FIG. 2.

reflected in the free glass surface (Fig. 2) one will see that the outlines will doubly reflect on the face and back, but that in the flowed part to the upper left from the line, $m c n$, the double contour, $a c$, originating from the lower surface, is of a deep dark-red, while on the uncoated parts the stripes, $c b$ and $d e$, are light gray, showing a strong delineation. The difference extends to the quite dark reflections of the window-sashes, which in the uncoated part are always somewhat foggy, but in the coated part intensely blackish-red.

Finally, I would remark that all these appearances can now, of course, be also reproduced photographically. In place of the porcelain, glass or a dry plate is sufficient, which in the printing-frame is fitted with a mask having a circular opening, and behind which one or several pieces of plate glass, fastened together with glycerine, are placed in optical contact.

If sufficiently exposed, the halo will surely be obtained.

A dry plate, of which one-half is coated, may also be exposed in an interior in such a way that a lighted window will cover one-half of the coated part of the plate and the other half on the uncoated part. A striking difference will be seen in the development.

AN INTERESTING LETTER.

ALLEGHENY COLLEGE,
MEADVILLE, PA., April, 1890.

To the Editors of the BULLETIN :

A FEW weeks since I turned my attention to wet-plate photography, and have met with, what our photographers here think, a curiosity. When I took charge of the laboratory of this college several bottles of Anthony's collodion were among the stock on hand. As I had been familiar with the laboratory for fifteen years I considered the collodion as valueless on account of its age, and until I began to work with wet plates I paid no attention to it at all. To-day I tried it and found that I could make a very good negative with it by giving about twice the time usually required for new collodion. I was curious to know just how old the collodion was, and, on examination of the bottles, I found a United States revenue stamp, dated March 31, 1865, which makes the collodion twenty-five years old at least. It was certainly new to me that this article could be kept in the damp and light for a quarter of a century, and yet be in pretty good condition. I thought that, possibly, no one had tried twenty-five year old collodion before, and it might be interesting to you to know how it works.

Very respectfully,

J. H. MONTGOMERY.

CRAMER'S NEW FORMULAS.

PYROGALLIC acid has been mostly in use, and eikonogen has lately come to the front and gained much favor. From our own experience we can highly recommend eikonogen.

In describing both methods, we shall give the formulas which in our hands have proven to be best adapted for our plates, and give them in English and French measures, although not always in the same quantities, as this would cause odd figures, but in the same proportions.

Preliminary Remarks.—In compounding the developer, carbonate of potassium or of sodium in different forms may be used to answer the same purpose, if proper attention is paid to their relative strength.

Twelve parts carbonate of sodium crystals (commonly termed sal soda or washing soda) are equivalent to 5 parts carbonate of sodium, dried, or 6 parts carbonate of potassium.

The sulphite of sodium is added to prevent rapid decomposition of the pyro or eikonogen. Too much sulphite in the developer renders its action slower.

The sulphite of sodium "crystals" are preferred to the "dried or granulated" by reason of their greater purity, but as the crystals will melt during hot weather in their water of crystallization, the dried sulphite of sodium may be found more convenient in hot climates.

Two parts of the crystals are equal to 1 part of the dried or granular sulphite.

PYRO DEVELOPMENT.

Prepare the following solutions :

English Measures. Troy Weight.	No. I. ALKALINE SOLUTION.*	Metric Weights and Measures.
64 ounces.....	Water	1,250 c.c.
2½ "	Carbonate of sodium crystals (sal soda).....	50 grams.
3 "	Sulphite of sodium crystals.....	60 "

This will produce negatives of a warm tone. If the sulphite is increased to 6 ounces, the negatives will be of a gray or black tone.

The alkaline solution must be kept in well stoppered bottles.

If the negatives show yellow stain, make a fresh solution, and try another lot of sulphite crystals.

No. II. PYRO SOLUTION.

6 ounces.....	Distilled or pure ice water	300 c.c.
10 grains.....	Oxalic acid.....	1 gram.
1 dram.....	Sulphite of sodium crystals.....	6 grams.
1 ounce.....	Pyrogallie acid.....	50 "

All pyro solutions work best while fresh.

Eight grains dry pyro may be substituted for 1 dram of this solution.

No. III. BROMIDE SOLUTION.

10 ounces.....	Water.....	300 c.c.
1 ounce.....	Bromide of potassium.....	30 grams.

FOR USE.

8 ounces.....	Alkaline solution.....	250 c.c.
2½ drams.....	Pyro solution.....	10 "

When the developer is quite new the addition of
from 10 to 40 minims | Bromide solution..... | 1 to 3 c.c.
is necessary to make it work perfectly clear.

Keep the developer moderately warm in winter, cool in summer.

Bromide solution produces intensity, contrast and clearness. It should be added when developer is strong in alkali and new, also when developer is warm,

* The alkaline solution may be prepared also by the hydrometer test, as follows :
Take of carbonate of sodium solution (hydrometer test 20).....32 ounces.
Take of sulphite of sodium solution (hydrometer test 28).....32 "
(If gray or black tones are wanted use more sulphite.)

when plates are over-exposed, or when the plates develop without sufficient strength and brilliancy.

When the developer is fresh it answers best for short exposures. After having been used once or twice it will work with more contrast and clearness. Therefore, if old developer is added to the new, it has to some extent the same effect as the addition of bromide solution.

If the developer works with too much intensity reduce it by adding an equal quantity of water, to obtain more detail.

For over-exposed plates old developer should be used, and if much over-exposed restrain by adding to the developer a good dose of bromide solution.

An under-exposed plate should be treated with diluted developer, without addition of bromide, in order to obtain more detail and less contrast. It can be improved after development by throwing off the solution and without rinsing the negative, leave it in the dish, pour water upon it and allow to stand for some time well guarded against light before fixing it.

Develop until the intensity is fully sufficient.

EIKONOGEN DEVELOPER.

English Measures. Troy Weight.	No. I.	Metric Weights and Measures.
40 ounces.....	Distilled water.....	1,000 c.c.
2 ".....	Sulphite of sodium crystals }	50 "
1 ounce.....	Eikonogen, finely powdered.....	25 grams.

Keep the solution in a well-stoppered bottle.

No. II.

1 ounce.	Carbonate of potassium.....	30 grams.
10 ounces.....	Water.....	300 c.c.

No. III.

1 ounce.....	Bromide of potassium.....	30 grams.
10 ounces.....	Water.....	300 c.c.

FOR USE.

3 ounces.....	Solution No. I.....	120 c.c.
1 ounce.....	Solution No. II.....	40 "
6 to 12 minims (or drops).	Solution No. III.....	$\frac{1}{2}$ to 1 "

When the developer is quite new it will be found necessary to add a little bromide solution (No. III) in order to make it work perfectly clear. The addition of old developer will answer the same purpose. The developer can be used repeatedly by occasionally adding more of Solutions Nos. I and II, omitting the bromide. It produces plenty of intensity by simply leaving the plate in it long enough. Any degree of softness can be obtained by diluting with more or less water, which is also recommended during hot weather and for under-exposures.

Over-exposed plates restrain by adding more solution No. III.

FIXING BATH.

After developing and rinsing the negatives may be fixed in a plain hypo bath, 1 part hyposulphite of soda to 4 parts of water, but the following formula is especially recommended:

4 ounces.....	Sulphite of sodium crystals.....	120 grams.
1 quart.....	Water.....	1 liter.

After being dissolved, add:

$\frac{1}{2}$ ounce.....	Sulphuric acid.....	15 c.c.
3 ounces.....	Chrome alum, powdered.....	90 grams.

Dissolve and pour this into a solution of

2 pounds....	Hyposulphite of soda.....	1 kilo.
3 quarts.....	Water.....	3 liter.

This bath combines the following advantages: It remains clear after frequent use; it does not discolor the negatives, and forms no precipitate upon them. It also hardens the gelatine to such a degree that the negatives can be washed in

* Hydrometer test of sulphite solution (before adding eikonogen), 15.

warm water, provided they have been left in the bath a sufficient time. The plate should be allowed to remain in the bath five to ten minutes after the bromide of silver appears to have been dissolved. The permanency of the negative and freedom from stain, as well as the hardening of the film, depends upon this.

Wooden boxes, with grooves to hold a number of plates, will be found both convenient and economical for fixing.

When the bath becomes weakened by constant use it should be replaced by a fresh solution.

If the development was in harmony with the exposure, the negative will not need any intensifying or reducing.

If too thin, from insufficient development, the negative should first be well washed to eliminate all traces of hypo, and then be strengthened with an

INTENSIFYING SOLUTION.

Prepare a saturated solution of bichloride of mercury in water, and pour of this a sufficient quantity gradually into a solution of

1½ ounces....	Iodide of potassium.....	50 grams.
6 "	Water.....	250 c.c.

until the point is reached when the forming red precipitate will no longer dissolve by shaking, but be careful not to add more mercury than just enough to make the solution very slightly turbid. Now add

One ounce of hyposulphite of soda.....	40 grams.
Dissolve and fill up with water to make total 20 ounces solution.....	800 c.c.

For use this should be diluted with about three parts of water. If the plate has not been thoroughly fixed the intensifying solution will produce yellow stains. Be careful not to overdo the intensifying. Should it have gone too far the negative can be reduced by placing it in the fixing bath for a short time.

Intensifying should be avoided, as the desired results can be obtained by proper development.

FOR REDUCING INTENSITY.

Dissolve one part red prussiate of potash in 15 parts of water. Wrap the bottle in yellow wrapping paper, as the solution is affected by light and will not keep long. Immerse the negative in a hypo solution—1 part hypo to 15 parts of water—to which has been added a little of the above immediately before use. When reduced enough, wash thoroughly.

THE FINAL WASHING

should be a thorough one, as the chemicals, especially the hypo, are very difficult to eliminate from a gelatine film. To insure perfect washing, a tank with vertical grooves is recommended, with strips placed horizontally about an inch above the bottom of the tank for the plates to stand on. This allows a free circulation of water underneath and around the plates. The water should enter at the bottom and overflow on top. Let the plates remain in this tank for at least an hour in running water. If no hydrant is at hand, wash an hour, changing the water often.

After the washing is completed pass a clean tuft of cotton or a soft camel hair brush over the surface of the plate, to remove any sediment from the water adhering to the film, and set aside to dry. When perfectly dry it may be heated and varnished with any good negative varnish.

FAILURES.

Foggy Negatives.—Caused by over-exposure; white light entering camera or dark room; too much light during development (notice precautions on page 279). Fog may also be caused by decomposed developer, introduction of hypo or nitrate of silver into the developing solution, from the fingers or from tablets used for wet plates; developer too warm or containing too much carbonate of soda or potassium without bromide.

Weak Negatives with Clear Shadows.—Under-development.

Too Strong with Clear Shadows.—Under-exposure.

Weak Negatives with plenty of Detail in the Shadows.—Want of intensity, generally caused by over-exposure. Shorter exposure and longer development will in most cases produce sufficient intensity. The addition of bromide solution (No. III) will also produce more intensity and contrast.

Fine Transparent Lines.—Using too stiff a brush in dusting off plates.

Transparent Spots.—Dust on plate, or air-bubbles while developing.

Crystallizations on the Negative and Fading of Image.—Imperfect elimination of the hypo.

Yellow-colored Negatives are caused by insufficient sulphite of sodium in developer, or if the article used is decomposed.

Yellow Stains are caused by using plain hypo bath which has assumed a dark color, or by not leaving the plate in the hypo bath long enough.

Mottled appearance of negative is caused by precipitation from the fixing bath containing alum, if the solution becomes old, or if it is turbid. It will not occur if the bath is prepared according to formula.

DAQUERRE MEMORIAL FUND.

To the Editors of Anthony's BULLETIN.

I send you a copy of the list of names of those who contributed one dollar to the Daguerre Memorial Fund at the Boston Convention. It has just been sent me by Mr. O. P. Scott, of 2220 Indiana avenue, Chicago, Ill. Mr. Scott says if he had the address of each one he would send him a receipt.

H. McMICHAEL.

In view of the statement of Mr. Scott we gladly acknowledge the amounts through our columns.—EDS. OF BULLETIN.

J. F. Ryder, George H. Hastings, H. McMichael, J. M. Appleton, O. S. Scott, G. H. Fowler, J. H. Plecker, J. Henry Doerr, E. Long, M. Ames, J. P. Dixon, E. P. Park, George Barker, E. J. Pullman, W. A. Webster, George H. Van Norman, William H. Mowry, Seth C. Jones, E. B. King, E. Dicker, J. B. Pelgriff, W. Irving Adams, George Ayres, Sweet, Wallach & Co., Frank A. Stinly, George Knowlton, H. G. Peabody, E. B. Conait, G. Cramer Dry Plate Works, E. C. Dana, J. E. Rosch, S. P. Wells, F. W. Geurin, J. C. Somerville, J. W. Bryant, George Murphy, H. S. Wier, C. Bolnell, Jr., George Hein, M. A. Seed & Co., D. H. Barker, J. S. Schindler, C. O. Lovell, F. Scheidel, Elmer Chickering, A. S. Southworth, William Shakespeare, G. W. Law, S. L. Schultze, C. S. Stuart, G. Cramer, George H. Chace, Charles A. Wright, Eldridge Stanton, W. H. Burbank, for American Amateur Photographer; Arthur A. Glines, Alfred A. French, Colonel Wilcox, Irving Saunders, E. A. Gilbert, Dr. A. H. Elliott, P. S. Rider, A. B. Costello, G. Gennert, W. I. Lincoln Adams, Alm Bros., Hyatt, W. S. Davis, G. W. Histed, W. Stuber & Bro., J. Carbutt, E. B. Ives, Mrs. Fitzgibbon Clark, Runton Bros. (2), Ginnelli, W. H. Allen, Alfred Hall, Mr. Benjamin French, Mrs. Benjamin French, Wilford French, A. C. Austin, Alfred M. Costello, Albert H. Pitkin, E. C. Fisher, G. H. Norton, Hetherington, W. E. Edmonds, John Ban , of Philadelphia (name blurred).

OUR ILLUSTRATION.

OUR good friend Conly, of Boston, again comes to our aid with one of his handsome studies. There is always something artistic about all his work, which at once attracts the admiration of every one who sees it. The soft lighting, the graceful lines of the subject carefully brought out, the incongruities subdued, and the feeling of life and action brought well into play, all make his productions admirable examples of fine photography. But why should we call attention to the work of one the mention of whose name calls at once to mind artistic photography. His work speaks too well for itself to need any praise from us.

made by exhibitor. There must be nothing on frame or print to indicate ownership. All frames must be in the hands of the committee by May 15th. Negatives must be such as have never before been exhibited. Judges will be three outside parties, appointed by the committee. Framed prints "for exhibition only" will be accepted, but frames must be so marked.

THE regular monthly meeting of the Club was held at the Club rooms, on Tuesday evening, April 1st, with a good attendance. Mr. Lowell, of the Blair Camera Company, was present and exhibited a new form of the Hawkeye camera and the improved English Compact camera with mahogany holders and tripod, which now makes the outfit a very handsome one. The following names were added to the list of members: Mrs. M. E. Whiton, Mrs. F. W. Ashcroft, Miss Mary I. Baldwin, Frank G. Huse, J. H. Sutherland, John J. Heys, Sylvester B. Breed, Thaxter N. Tripp, Thos. L. Burney, W. H. Blood, Jr., Wm. A. Burrill, R. H. Sutherland and D. A. Sutherland. Work has been started for the May exhibition, and it is thought that the rooms will be well filled.

MEETING, APRIL 8TH.

THE usual pelting rain served to keep many away from the exhibition at the rooms of the Lynn Camera Club, Tuesday evening, April 8th, but a good sized audience was present and witnessed the sets, fifty slides in each, of the Springfield and Worcester societies. Of the Springfield set the most notable were "Curtains of the Sky," "An Old Slate Mill," "River Bend" and "Cattle Grazing on the Range."

The slides from the Worcester Club were very good, and showed careful attention to the detail of the art. Those which attracted the most favorable comment were "Landing a Trout," "A Woodland Brook," "The Cascade," "At Elm Park," "A Jersey Cow" and "Steamer Lowering Funnel to Go Under Blackfriar's Bridge, London."

The Thomson lantern was used for the first time Tuesday evening, and proved successful in every detail. The Lynn Camera Club has received an invitation to participate in an outing with the Boston and Providence Camera Clubs, June 17th. The trip will be made to Providence and down the bay in a special steamer. The probable cost to the members of the Lynn Club will be about three dollars.

Those intending to go are requested to send their names to the Secretary of the Club.

An illustrated lecture, entitled Narragansett Bay, by the Providence Club, is booked for the next entertainment, which will probably be on Tuesday evening, April 15th.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A SPECIAL meeting of the Society was held on Tuesday afternoon, April 1, 1890, with *Vice-President* JOHN G. BULLOCK in the chair.

The Chairman announced to the Society the sudden death of their President, Mr. Frederick Graff, which occurred on Sunday morning, March 30th.

After the reading of the formal call for the meeting by the Secretary, remarks were made by a number of members, expressive of their strong affection and high admiration for their late presiding officer, and deepest grief at his loss. His kindly spirit towards all with whom he came in contact, his painstaking care and energy in all work falling to his share, his great interest in photography, and particularly in this Society, whose growth he had watched and fostered from its infancy, were dwelt upon. Among those who spoke were Messrs. John G. Bullock, John C. Browne, Frances T. Fassett, W. H. Walmsley, R. T. Hazzard, Edmund Stirling, Francis Burrows, Evan Ellis, and Dr. Charles L. Mitchell. Letters of condolence were also received from Messrs. W. D. H. Wilson, R. W. Kear, and Charles R. Pancoast.

On motion of Mr. Stirling a committee was appointed by the Chair to draft a suitable minute in regard to the death of Mr. Graff for publication in the daily papers, to report at the stated meeting on 2d instant, and also to prepare a more formal memorial to be published by the Society at a later date. The meeting then adjourned.

At the regular meeting held on April 2, 1890, the following minute, prepared in accordance with the action at the special meeting, was adopted and ordered to be published, after which, out of respect to the memory of their deceased President, the Society adjourned:

"The members of the Photographic Society of Philadelphia desire to testify to their sense of the great loss they have sustained in the death of their President, Frederick Graff. They feel that by his death not only have they lost a most efficient presiding officer, but

that each one has been bereft of a dear friend, a sage counselor, and one who gave of his very best to promote the interests and well-being of the Association.

"For nearly thirty years his official connection with the Society has been continuous—as Chairman of the meeting called to organize the same, then as Vice-President, and serving two terms as President. He may indeed be called its father. To his untiring zeal for its welfare the Society is in a great measure indebted for the present high position it holds in the photographic world.

(Signed)

"JOHN G. BULLOCK, *Vice-President*.

"ROBERT S. REDFIELD, *Secretary*.

"April 2, 1890."

AN ADJOURNED STATED MEETING.

AN adjourned stated meeting of the Society was held Wednesday evening, April 9, 1890, with *Vice-President* JOHN G. BULLOCK in the chair.

Communications were read by the Secretary from the New Orleans Camera Club, inviting members to be present at the opening of their new rooms on April 16th, and from the editor of the *Photographic Times*, presenting a copy of "Practical Photo-micrography," by Andrew Pringle, for both of which votes of thanks were passed.

The Secretary also reported that owing to the removal of the Society of Amateur Photographers of New York to new quarters, which would fully engross the attention of both officers and members for some months, they desired to postpone holding Joint Exhibition until some time in the autumn. The Joint Exhibition Council, however, had decided that for various reasons a fall exhibition was not advisable, and it had therefore been agreed to postpone the exhibition until the spring of 1891.

The Committee on Lantern Slides presented a full report in regard to the public exhibition of slides, illustrative of the work of members, which had been held at Association Hall on the evening of March 12th. The exhibit was one of the best ever made by the Society, and furnished unmistakable evidence of a general improvement in technical and artistic photography on the part of the members. The attendance was large, and the display was evidently a source of pleasure and satisfaction to all who saw it. One hundred and eighty-three slides were selected by the Committee for exhibition, representing the work of fifty-

three members. Mr. Frank Bement kindly loaned his dissolving lantern and exhibited the slides, and Dr. Charles L. Mitchell acted as spokesman of the Society, welcoming the audience and announcing and explaining the views as they appeared on the screen.

The Committee on Membership reported the election of the following active members: Erwin Agnew, M.D., Jerome B. Craven, and George Howard Perkins.

Mr. Browne, referring to the loss the Society had sustained in the death of their President, Mr. Frederic Graff, said it had seemed to certain of the members desirable that the position of President should be filled at once. In the minds of some it was an open question whether by virtue of the death of the President the Senior Vice-President did not become President. It was desirable to remove all uncertainty in regard to the question, and he therefore nominated Mr. John G. Bullock for the office of President. The nomination being seconded by Mr. F. T. Fassitt, Mr. Bullock was unanimously elected President.

Dr. Mitchell, of the Executive Committee, read a communication which had been handed to him by the author, Mr. Frank H. Rosengarten, entitled, "Working Department of the Photographic Society of Philadelphia." The paper was a lengthy plea for enlarging the scope and usefulness of the Society, giving a history of previous efforts which had been made in this direction, and accompanied by circulars and other data illustrative of the workings of the Camera Club of London.

Considerable discussion followed the communication, during which Mr. Browne called attention to the fact that before the end of the year the Society would have to consider the important question of a change of quarters, and also the undesirability of discussing important matters of this kind in open meeting. He thought a special committee might be appointed to consider all propositions made to it, and in this way relieve the Society from a great deal of discussion.

Dr. Mitchell moved that the Chair appoint a special committee, to consist of the President, Vice-President, Secretary, and Treasurer, and six other members, to consider and report to the Society the advisability of procuring other and more convenient quarters, and the institution and development of a suitable working department for the instruction and improvement of members in the photographic work.

Carried.

On motion of Dr. Mitchell it was also resolved that a special committee of three be

appointed by the Chair to make such revision of the by-laws of the Society as may be needed, and to report at the regular meeting to be held on October 1, 1890.

Mr. Carbutt, alluding to a letter he had read at a previous meeting, from Mr. Pancoast, in regard to keeping qualities of plates, showed a negative sent him by the same gentleman, made recently on a Carbutt A Plate which had been coated about 1884 or 1885. The negative showed no signs of deterioration on account of age of the plate.

Mr. Browne, referring to the appointment of a committee to ascertain the cause of certain deterioration in lantern slides, said that within the last two weeks he had examined a large number of slides with a table microscope having a two-inch objective. With a glass of this power, he noticed that in a good many cases the crystallization or cloudiness is formed on the cover glass, but not invariably so. It has been said that a great deal of this difficulty arises from the quality or composition of the glass—that from the thin glass now used both for picture and cover emanates some chemical injurious to the slide. This might be so, but in his experience, which had been almost entirely with the quality known as “B. P. C.,” he could not lay this fault to the glass. In examining the slides he found a great deal of matter evidently deposited from impure washing water, which seemed to consist of particles of vegetable matter, mud and sediment of various kinds which had not been perfectly washed off. He also thought that the central spots from which the crystallization started were sometimes due to hyposulphite of soda in the gelatine film. Years ago, having trouble of this kind, he had commenced using diluted cyanide of potassium instead of hypo for fixing slides. Slides so fixed did not show any of the faults in question. A great deal of the trouble, he thought, arose from intensification. The purchasers of commercially-prepared slides demand very dense positives, which makes it desirable to use some form of intensification. Among the chemicals used for this purpose is sulphide of potassium, which to his mind is most objectionable. He had found the treatment with bichloride of mercury, followed by a bath of bichloride of platinum, to make a permanent and safe intensifier.

Mr. Fassitt had found the treatment with mercury invariably fatal to a gelatine slide.

Dr. Wallace thought the question of fading depended not so much on the use of mercury as upon what the mercury was followed by.

If ammonia was used the result would be disastrous; but with cyanide of silver the picture would not fade.

Mr. Carbutt, referring to the use of cyanide of potassium for fixing gelatine slides, said it could be used if a perfectly pure article was obtained. The ordinary commercial cyanide contained caustic potash, which had a deleterious effect on the film. He recommended a solution of 8 or 10 grains to the ounce as suitable for fixing an ordinary gelatine plate with safety.

Mr. Rosengarten said that most of the hypo used contained large quantities of foreign matter and impurities. In his own practice he used only the pure article.

Mr. Bell indorsed the remarks of Dr. Wallace relative to the use of mercury. It was not the mercury itself, but what followed it. If followed with bromide of potassium it was perfectly permanent; if with sulphide of soda the same as ammonia. If with cyanide of silver, it is perfectly permanent.

Mr. Carbutt claimed that there was no need of intensifying lantern slides. He had been making some positives requiring great density; it was simply done with pyro, soda and bromide.

The action of the alkali should be well restrained, and the exposure as full as subject and conditions will allow.

In the instance referred to, it was nearly a minute before the image began to show. It was a positive made by contact. For the purposes of those using his process plates, the developer consisted of:

Carbonate of soda crystals	2 ounces.
Sulphite of soda crystals. 4 “	
Bromide of soda or potash	60 grains.
Water	60 ounces.

To each ounce of the above, $2\frac{1}{2}$ to 3 grains of pyro is added. By this means perfectly clear glass in the transparent parts of the negative and very dense blacks can readily be obtained.

The meeting closed with the exhibition of one of Moessard's Panoramic Cameras, recently imported and sent by Mr. Frederic Gutekunst.

Adjourned. ROBERT S. REDFIELD,
Secretary.

THE PHOTOGRAPHIC SOCIETY OF JAPAN.

A MEETING of the above mentioned society was held in the Public Hall, Yokohama, on the evening of Saturday, 22d March, Mr. J. Johnstone in the chair.

After the minutes of the previous meeting had been read, the following gentlemen were unanimously elected members of the society: H. E. Watanabe Hiromoto (President of the Imperial Society), Professors B. Koto, J. Milne, and Aug. Revilliod; Mountjoy Squire, Commander R. N., and Messrs. J. Fraser, G. Scott, A. Futami, T. Tanaka, T. Enami, S. Nihara, A. R. Lamb, and W. Willet.

A lantern exhibition was then given. Professor Milne opened the proceedings by a lecture on earthquakes, illustrated with maps showing the distribution of volcanoes and of districts subject to seismic phenomena throughout the world, and more particularly through Japan, and by a set of slides from photographs of the destructive effects of earthquakes in all parts of the world. Some of these showed the danger of arched structures where earthquakes prevail, others how fracture follows vertical lines of apertures in buildings, and one how the end house of a row may be, so to speak, heaved away by the momentum of the others, which, themselves, remain intact.

After this there was an exhibition of a popular nature. There was a large attendance of members and visitors who seemed to thoroughly appreciate the pictures, but, unfortunately, the proceedings were considerably curtailed by a mistake of the exhibitor, who threw the words "Good night" on the screen while there were still many slides to be shown. The audience rose and were out of the hall before there was time to explain the matter.

The lantern was (with the trifling exception mentioned above) handled by Mr. Takashima Matsuchi.

PACIFIC COAST AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE many interesting events promised to the members for the meeting of March 27th brought out a large attendance.

Professor Bolton, of the New York Society, addressed the Association and exhibited his photographic outfit. By an ingenious use of the bayonet catch three lenses are made to fit into one flange; to change from a long to a short focus lens is but the work of a moment, and to top this complete arrangement a Newman shutter is so fixed that it adapts itself to any of the several lenses.

Answering the statement of the President, that he was an old and enthusiastic photographer, Professor Bolton replied that, while he claimed to be enthusiastic, he could not claim

to be a veteran, having only within a short time taken up the study for the purpose of recording certain phenomena in the deserts of Arabia.

Professor Bolton is now on his way to the Sandwich Islands. Upon his return the Society hopes to have the pleasure of again listening to him.

An interesting and instructive paper was read by Dr. A. P. Whittell, in which he recommended the use of saturated solutions in place of the system of weights and measures in use at present. To support his suggestions he instanced the method now in vogue throughout the medical world for measuring solutions of cocaine, bichloride of mercury, etc.

The doctor also exhibited a very compact camera of his own design. To economize space the lens, when not in use, is made to fold inward. The holder, which is only a couple of inches in width, holds twelve glass plates, or one hundred films. By the use of springs similar to those used in a faro box—(the doctor drily remarked: "Of course, none of you know the details of a faro box")—it is an easy matter to put a fresh plate to the front. A small changing bag is necessary to do this, but the ingenious construction of the holder makes the operation an easy and safe one.

A friendly letter was read from the President of the California Camera Club, an organization differing from the Pacific Coast Amateur Photographic Association in that there is no restriction upon the members as to the disposition of their work. The Secretary was instructed to respond in the same spirit of goodwill, and to offer the rooms of the Society for the next meeting of the Camera Club, or until they secured permanent quarters.

Resulting from the resolution adopted at the previous meeting providing for the admittance of ladies to active membership, twelve names were balloted upon. It is pleasing to note that the vote cast was the largest ever polled in the history of the Society, and it is unnecessary to state that their admittance was unanimously favored. This change will put new life into the Society, as the work of many of the lady amateurs equals the best of the most skillful of the sterner sex.

At the conclusion of the evening's entertainment, which included a large collection of lantern slides, some of them by Mr. Requa, who has just returned from a trip through Europe and Asia and part of Africa, the members sampled a large bowl containing a huge lump of ice and some slices of lemon.

The solution looked like a pyro developer, but it wasn't. There could not have been a better medium for drinking the health of the newly elected President, Mr. E. L. Woods, and the Vice-President, Major W. H. Heuer.

When these lines are read the exhibition of the Association will probably be a thing of the past, but a description of the work presented will be given in these pages in a later number.

A. J. TREAT, *Corresponding Secretary.*

BROOKLYN SOCIETY OF AMATEUR PHOTOGRAPHERS.

THE private reception and exhibition of work of the Brooklyn Society of Amateur Photographers, which was held at the rooms of the Society on the 8th inst., was a source of much pleasure to the members and their many friends. Among the best work of members shown may be mentioned a series of flash-light character sketches by Mr. Elliot Emery; several landscape and marine views by Mr. Haley, which were marked in nearly all cases by clear-cut outlines, good composition and excellent technical characteristics; views of Prospect Park by Mr. V. Trowbridge; some Alaska scenery and incidents by Mr. Forman; and various bits of detective work by Mr. Ormsbee, all had good points; a series of interiors, the work of Mr. Ackermann, possessed especial interest. Mr. G. R. Sheldon, Jr., was also represented by landscape and flash-light work, and many other members were there with results which prove them to be hard workers.

This Society has been organized only a little more than a year, but have already an active membership of thirty. Their rooms are centrally located, and they consist of a dark room, meeting room, executive and smoking room, and the Society has reason to congratulate itself on the progress of its first year. Its officers are: C. M. Trowbridge, President; Homer Ladd, Vice-President; H. P. Sewell, Secretary; E. D. Litchfield, Treasurer.

NEWARK CAMERA CLUB.

THE Newark Camera Club held its annual meeting April 14th, and elected the following officers for the ensuing year: *President*, WILLIAM A. HALSEY; *Vice-President*, CHARLES LEROY; *Secretary*, C. G. HINE; *Treasurer*, J. M. FOOTE; *Executive Committee*, MILES T'ANSON, C. G. HINE, Dr. T. Y. SUTPHEN, J. M. FOOTE, CHARLES LEROY, F. T. FEAREY, PAUL THIERY, H. C. McDOUGALL and GUY J. EDWARDS.

The annual reports showed the Club to be

in a flourishing condition. On May 1st it moves to new quarters, at 828 Broad street, which are now being fitted up.

Some time during May the third public lantern slide exhibition of work by the members is to be given, when its numerous friends will have an opportunity to see what the Club is doing in that line.

C. G. HINE,
Secretary.

POSTAL PHOTOGRAPHIC CLUB.

THE members of the Postal Photographic Club exhibit sixty-six prints in their April Album. Conspicuous among others no less interesting are "Place aux Dames," sepia platinum, Max Hausman; "Bethlehem Hills," plain paper, W. A. Prentiss; two "Artists' Studios," Miss E. V. Clarkson; four fine surf studies, W. G. Chase.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—C. P. writes: I thank you for your kind answer in the last BULLETIN. Please tell me in your next BULLETIN the formula for collodion transfer, and what strength of the silver bath is used for the above; also, the developing formula for half-tone as well as black and white subjects? And how to make it transfer from the glass plate on to the copper or other metal plates?

A.—A detailed description of the various steps in the process are too long for these columns, and any brief description would only lead to disappointment and failure. Consult Wilson's "Photographics," page 335 and following pages; "Silver Sunbeam," page 150, and "Photo-engraving," by W. T. Wilkinson, page 34 and following pages. In these books all details are given, and a choice of methods, differing according to the character of the picture to be transferred and the material on to which the transfer is made.

Q.—H. C. T. writes: Will you kindly inform me in the next issue of the BULLETIN the best formula for making blue prints: what paper to use, and do you know of any way to tone the prints brown or black without discoloring the whites?

A.—A good formula is the following:

No. 1.

Potassium ferricyanide (red prussiate of potash)..... 1 part.
Water 4 parts.

No. 2.

Ammonio-citrate of iron... 1 part.
Water..... 4 parts.

Mix equal parts of the above solutions, and add to the mixture one-tenth of its volume of thick mucilage made with gum arabic. The paper may be now coated with the mixture by applying evenly with a soft sponge. Solutions 1 and 2 keep well if separate, but soon deteriorate if mixed; it is therefore best not to mix more of the solutions than is necessary for the work on hand. The dry coated paper will keep many weeks. Any good smooth and moderately thick paper will answer—plain photographic paper being the best for fine work. We do not know of any good method of changing the color of blue prints, although several have been published in the BULLETIN.

Q.—R. W. writes: Please give me, through the BULLETIN, the formula for a pure white developer for tintypes? That given on the collodion bottles is not sufficient. Also give me the method of mixing the developing solution on page 117, also on page 132 of the "Silver Sunbeam."

A.—The following formula given by Estabrooke gives fine whites, if you use part old developer mixed with the new, after the image has been started with new developer. Care must also be taken not to over-expose the plate:

Protosulphate of iron.... 1 ounce.
Acetic acid..... 1 "
Alcohol..... 1 "
Water..... 16 ounces.

In the formula on page 117 of the "Silver Sunbeam," to the $6\frac{1}{2}$ ounces of water add the

sulphate of iron, and when it is dissolved add each of the other materials in the order given; finally shake well and filter. The same rule will apply to the formula on page 132.

Views Caught with the Drop Shutter.

WE note the marriage of Mr. W. R. Bowles, the photographer, of Hopkinsville, Ky., to Miss Jessie Haden, on April 17th, and offer congratulations.

JAMES F. HYDE, the ticket speculator who shot and killed William Turnbull in front of the Fourteenth Street Theatre, Saturday night, was held to await the action of the Coroner, in the Jefferson Market Police Court, yesterday. His eyes were badly cut from the point of Turnbull's umbrella, and his clothing was marked with blood. Justice White ordered that a photograph be taken, so that his appearance could be used as evidence in his own behalf.—*New York Paper*.

B. F. HOPKINS, of Greenfield, Mass., has a set of bound volumes of the BULLETIN since 1872, which he would like to dispose of. Those of our readers who desire to complete their sets should address as above.

POLLOCK, RIKER & Co. have opened a new store for photographic supplies at 53 Nassau street, New York City, and in connection with their laboratory at 198 William street, have excellent facilities for photographic printing and enlarging on bromide paper.

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WINTER AT LICK OBSERVATORY, CAL.

J. W. H. H. H.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

MAY 24, 1890.

Vol. XXI.—No. 10.

PSEUDOMORPHS.

IN the mineral kingdom we often find a class of crystals that, while they have a certain chemical composition and exhibit certain well-defined properties, such as hardness, cleavage, specific gravity, and so forth, peculiar to the substances having this definite chemical nature, they are entirely misleading in the matter of crystalline form. For instance, crystals of quartz often take the form of calcite, fluor spar or barite; that is while the form of the crystal would lead us to believe that the substance is calcite, fluor spar or barite, the hardness, cleavage, specific gravity, and chemical composition, all would prove the crystalline body to be quartz. In a word, these crystals are false to their crystalline structure, and the mineralogist has given a name that embodies this idea; he calls them pseudomorphs or false forms.

Now amateur photography is beginning to exhibit a similar state of affairs. There is a constantly increasing number of amateur photographers who seem incapable, or are too lazy, to develop the plates that they expose in the camera. All they care to do is to take some automatic machine in the form of a camera, hold it up in front of a view and trip an instantaneous shutter. These exposures, plates or films are handed over to some other person to develop, fix and make ready for the printer; or the same individual may even make the prints and mount them. All that is done by these so-called amateur photographers is to select the view and expose the plate; and it appears to us that they are not entitled to be considered as amateurs any more than the man that turns the panorama should be called an artist, or the quarryman a sculptor. It is true that a certain amount of artistic taste is necessary in the selection of the view, but the production of a good negative after the exposure is made is a matter of training, skill and patience, that only comes to those who love the art of photography. These pseudo-amateurs are rushing into our societies, and receiving the same rights and privileges that belong only to the true amateur, the lover of our art. Many of them are utterly incapable of producing a decent negative, and are no more amateur photographers than the daubing school girl who colors a bromide enlargement and thinks she is an artist. The success or failure of the exposures of these pseudomorphs depends not upon the selection of the view, but upon the skill in development of some other person, and they should not be allowed the same rights and privileges, neither should they be

classed among the true amateur photographers. They are a species of diletanti that are gradually bringing photography into disrepute, and if they wish to be connected with amateur photographic societies, should be classed as a separate set of members from the regular workers.

One thing more than another that has served to encourage the growth and development of pseudomorphs in photography is the rise of a number of firms who make it a business to develop amateur negatives. We do not blame those men of business; it is a question of profit with them, but the tendency is to debase photography, and, instead of encouraging a healthy association of men and women in the pursuit of an art, we are fast drifting into the condition where those outside photographic circles remark: Oh! anybody can take photographs. Now, every true worker in the art knows that this is not so, and those who are encouraging any such ideas are simply helping to retard photographic progress. What we want are workers, artists and lovers of photography, who will take the trouble to search diligently for the beautiful, and, having found it, will take greater pains to develop the beauty upon the photographic negative with their own hands. We want workers like the old etchers, not merely satisfied with cutting the scene into the wax on the surface of the plate, but who lovingly, patiently and earnestly watched the plate in the etching fluid, so that every detail might be brought out to give character and life to the future. This is the spirit of the true amateur photographer. He loves to see the view in process of creation under the influence of the developer; he marks every detail as it appears, and patiently coaxes out those points in the negative that caught his eye in the scene to which he presented his camera. The amateur that exposes the plate and, with an artist's eye, notes the scene in front of the camera, is the one, and the only one, that can properly develop the negative of that scene. If other hands undertake the work they invariably fail to bring out some details essential to a good negative, or in straining after something unimportant block up features of the view that otherwise would add to its charms.

What we have said is uttered kindly and in the spirit of love for our art. Those of our readers who are drifting into carelessness and indolence in the matter of making negatives should shake these off, return to their old love, and develop both themselves and their own negatives. Above all things ignore work where but a small portion of the resulting product is the work of the individual to whom it is credited. Don't be satisfied with the advice, "You push the button, we do the rest," but do it all yourself; push the button, make the negative and print, mount it, and if it is not all you desire, it should urge you to yet other efforts, rather than to a state of indolence, in which you accomplish nothing yourself and utterly fail to appreciate the efforts of others.

EDITORIAL NOTES.

"THE INTERNATIONAL ANNUAL" will be published on the first of June, and will be replete with interest to all lovers of photographic literature. It will contain 186 articles from the best authorities in the world, and will be illustrated with 21 plates, representing all the leading reproductive processes in use. The German contributors have made a particularly good showing.

THE first of a series of Saturday afternoon excursions was enjoyed by members of the Department of Photography of Brooklyn Institute on the 17th, and

certainly the party was favored with every good thing in the way of photographic conditions—the day being one of the loveliest of the season. We expect to see some interesting results from the excursion.

THAT old, historic building, Clinton Hall, so long a landmark to New Yorkers and the scene of the famous draft riots of the Rebellion, is now in process of demolition, and will soon be only a memory. Mr. T. C. Roche, of the BULLETIN staff, has, however, secured some excellent negatives of it in its original condition, and we mention it as being of interest to such as may wish to obtain reminders of this interesting relic. The photographic section of the American Institute, which has hitherto held its meetings in this hall, have removed to 111 to 115 West 38th street, between Broadway and Sixth avenue.

DR. LEO BACKELANDT gave a very instructive demonstration of the method of carbon printing, at the rooms of the New York Camera Club, on the evening of May 12th.

WE have received invitations to the Sixth Annual Exhibition of the Providence Camera Club, which took place on the 20th instant, and hope to furnish a report of the same in a later issue.

WE note with interest that the proprietor of the Breeze Lawn Hotel, at Hunter, N. Y., in the Catskills, has constructed a fine dark room for the free use of professional and amateur artists who are guests at the house.

ACCORDING to Professor O. N. Rood, of Columbia College, the retina of the human eye is so sensitive to the action of light that a flash lasting only one forty-billionth of a second is sufficient to make an impression upon it. How near to this susceptibility we may ever attain in the making of dry plates is a question.

DURING the week from May 12th to 17th the Yonkers Photographic Club held their annual exhibition, the result being a fine collection of work which was viewed with pleasure by the many friends of the Club.

WE note from our exchanges that a German chemist has discovered that by the simple melting of the ingredients mentioned below, a transparent red glass is obtained, which is adapted to the manufacture of various articles in use for photographic work, and by which the second heating of the glass for its intensification is avoided. His method is to combine fine sand, 2,000 parts; red oxide of lead, 400; carbonate of potash, 500; lime, 100; phosphate of lime, 20; cream of tartar, 20; borax, 20; red oxide of copper, 9; and binoxide of tin, 13.

Two charming bits of work come to us from Dr. G. L. Sinclair, of Halifax, N. S., both printed on aristotype paper, one being a winter landscape and the other a group of cattle. They both show excellent taste and skill. The doctor says the prints were made on paper a year old, but they are excellent in every respect.

It gives us pleasure to note that one of our professional brothers, A. C. McIntyre, of Alexandria Bay, N. Y., at the Thousand Isles, has built and equipped a dark room for the exclusive use of amateurs and tourist photographers, free of charge, and we hope our friends traveling in that direction will avail themselves of Mr. McIntyre's generosity, that he may see his efforts are appreciated.

J. F. RYDER, of Cleveland, sends us a print from negative of Rhea in "Josephine" at the opera house there, made with the King flash lamps. The lighting is good.

IN the last issue of the BULLETIN we called attention to the fact that Messrs. R. S. Redfield and C. R. Pancoast had been awarded prizes at the exhibition of the Photographic Society of India, and we now have to state that these same gentlemen and J. G. Bullock have all three been successful in taking prizes at the recent exhibition at Newcastle, England. The prize picture by Mr. Redfield was entitled "Victuals and Drink," and was classed under genre. This took an extra silver medal, while his "Hesitation" was noted as being a beautiful picture. C. R. Pancoast receives mention for one picture under the same class, called "A Letter from My Boy," and a silver medal also for several Indian interiors, exhibited under class devoted to architecture. J. G. Bullock was awarded a bronze medal for work in class of landscape pictures. Mr. Redfield also took a silver medal in lantern slide class.

WE are indebted to Professor S. W. Burnham, of Lick Observatory, for a report of double star observations made at the observatory during May, June and July of 1889, which is a record of an immense amount of detailed and patient labor.

E. KLAUBER, of Louisville, has sent us a collection of gelatine prints from negatives made after the cyclone which recently caused so much damage in that vicinity. They are interesting mementos of that destructive storm, and well exhibit the havoc it caused.

W. G. CHASE and W. H. Kennard lately exhibited, under the auspices of the Boston Camera Club, a most interesting series of Japanese photographs, about 150 in number, of which many were colored in a soft tint, which gave an extremely pleasing effect.

THE Society of Amateur Photographers of New York announces that it has decided to publish its proceedings, and we have before us the first number of its publication, which is edited by William Hapgood, of the Committee on Publication.

YOUR BULLETIN is highly appreciated by me, as all the information I have required I have found in it. Had I not subscribed I should not have known what to do in many instances.

WILLIAM BJORKLAND, Mexico.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

The New Photographs in Natural Colors—Portrait Photography and Eoside of Silver Plates—Orthochromatic Photography under Different Atmospheric Conditions—The Emperor and Empress of Germany and Photography.

THE latest novelty in photography are the photographs in natural colors by Mr. Veresez, of Klausenburg, Hungary. They are—as communicated by Dr. Eder at the meeting of the photographic society in Vienna—partly on glass and partly on paper. The glass pictures show a ruby-colored tone, which prevails as ground tone in the majority of the “diapositives” presented. Upon them is seen a brightly colored, brilliant picture, in which particularly a deep ruby-color and a light orange is perceptible. Besides these appears also a distinct blue-violet to blue, while the green is less apparent.

The contours of the photographic pictures are completely sharp, and the several colors set off distinctly from each other. The paper pictures possess a gray-brown ground-tone, from which a precise photographic picture in natural colors sets off. Here the ruby-colored tone surpasses also the orange color.

On one of the pictures is also seen a distinct blue-violet. These photographs are fixed to a certain degree (which until to-day was an impossibility), and they did not change in the least after lying in a lighted room; besides this, they were examined in daylight by several persons, not the slightest care being taken, without any injury to them.

These communications, of course, awakened a general interest. The correspondent of the London *Standard* saw cause to interview Dr. Eder, and gives a report of over two columns about his interview with him.

The color sensitive preparation is, according to Eder, a chloride of silver collodion or a chloride of silver gelatine-emulsion, flowed on glass or paper. On glass, the pictures are copied in two to three hours; on paper, three days; and they are fixed in an alkali bath. According to Eder's conjecture, Lea's photo-chlorides of silver here enter into the action. “A strict test as to constancy in light has not been made yet,” says Dr. Eder, and he adds: “It would be of fundamental significance if the permanent fixing of the photographic picture in natural colors had been successful.” (*Phot. Corr.*, April, 1890.)

I put myself now in personal communication with the inventor, and received at last the photographs in natural colors.

The inventor, in his letter to me, says expressly that he has worked only with the printing frame and not with the camera. These are his words: “People make too much noise about my invention. In its present state it is very interesting for science, and, in course of time, it will be so for practical purposes. But this will require a good deal of money yet. I have let the thing rest for eight months.”

The pictures which I received were some on glass and some on paper. The glass pictures are of two different kinds. One kind shows in its transparency a fire-red ground and the imprinted figures negative; the several colors cannot be recognized, or are seen very defectively in their transparency, but when viewed from the surface we recognize the red and yellow, and partly some blue of the dresses; in the trees even some dark-green with dark brownish-gray ground. The second kind of the pictures, evidently the most handsome, show the colors

in their transparency particularly brilliant, especially red, violet and orange. The ground is brown-violet. Looked at from the surface, the red tones appear here light green and the violet ones dark green, almost complementary.

Of the paper pictures, four large sheets, $16\frac{1}{2} \times 25$ c.m., deserve particular attention. They show the same picture, a vase with flowers. The original seems to be a lithograph, which came partly black, partly colored, for application. The black of the drawing has reappeared as black. The colors of the original are not known to me. The ground is greenish-gray to brown. On the pictures, apparently copied from a colored original, one can recognize best a copper-red, orange, and a gray-blue of the leaves.

The orange-colored parts appear in the transparency conspicuously lighter than the rest.

As a general thing the colors do not appear as brilliant on the paper pictures as on the glass pictures of the second kind. They are, however, more brilliant than on the glass pictures of the first kind (with fire-red ground in the transparency).

Agreeing with Eder the experimental proof as to their durability seemed to me to be of interest. For the purpose of informing myself I wrapped up a glass picture in a piece of tin-foil, into which a small opening was cut, so that the brown ground of the picture could be seen. I took also a paper picture and covered it so that only the red foreground was visible. In this way I exposed both at 4 p.m. on April 15th, to a somewhat veiled sunlight.

After twenty minutes action of the sun not the slightest change of the red color had taken place. But the brown ground of the glass picture showed a visible darkening. The glass pictures of the first kind (with fire-red ground in the transparency) were wrapped up in tin-foil in a similar way, as above, and a part of the red ground—no more sunlight being at my disposal—was exposed to the electric light for seven minutes at a distance of 15 c.m. Result: The red ground became dark red. The durability of the glass pictures is therefore not absolute. It may be the same with the paper pictures; the change is not so easily perceptible when looked at from the surface.

Another important point is, whether the photographed colors correspond actually with the natural ones. All previous photographic pictures in natural colors showed this only approximately, least of all blue and green, the "warm" colors somewhat better. This circumstance influences the value of photochromy perhaps just as much as the durability.

If Veresez pictures appear more durable than the older ones of Poitevin, Zenker, etc., the reason for this may be that the material used by Veresez is not so sensitive. He has to expose three days on paper, while Zenker finished his photo-chromes in sixty seconds.

Color sensitive eoside of silver plates are now introduced more and more into portrait photography for colored costumes. Professor Schirm photographed at the Berlin Artists' festival, at night, two hundred and eighteen groups in colored costume, with flash light, and applied even a yellow glass to subdue the prevailing blue in the magnesium light. Herr Schirm used eosin plates which he had bathed himself, and he succeeded admirably with his instantaneous pictures, a sure proof for the sensitiveness of the plates.

Photographers who have many military customers have used the eosine-silver plate without yellow screen for a long time already. How great the difference is

between ordinary plates and eoside of silver plates, when colored costumes or military uniforms are to be taken, is proven by the two pictures in the April Number II of the "Photographische Mittheilungen."*

Experience has shown that the orthochromatic action of daylight differs greatly on different days. A blue sky acts weakest, and a sky with white clouds is preferable.

It is now known that the quality of light within a day changes considerably with the course of the sun. According to the height of the sun, and according to atmospheric cloudiness, more or less photographically effective light is furnished by the sky on one side and by the sun on the other side. The phrase: "Photographically effective light" has changed in meaning in the course of time. As long as we worked with iodide of silver collodion plates it was essentially indigo-colored light (solar spectrum line, *G*), which came into consideration. Violet and ultra-violet light, which is also taken into account, is actually so little reflected from our solid bodies that said lights do not at all come into consideration.

With the introduction of the color sensitive plate the case has changed materially.

Since we have succeeded in manufacturing eoside of silver plates, which are from six to ten times more sensitive for yellow than for blue, the quantity of the yellow, *i. e.*, the green-yellow light in the atmosphere, plays the principal part in the photographic action.

I have proven already in 1874 that there are remarkable deviations in the chemical action of the solar spectrum upon photographic plates, which deviations appear most toward the ends (violet, also yellow and red—I worked already at that time with color sensitive plates), even at equal position of the sun and apparently equally good weather.

In 1875, during my trip to the West Indies, I made a number of spectrum experiments in the Red Sea and Indian Ocean with collodion plates whose sensitiveness for blue and yellow was about even. We made five spectrum views daily. On one day the action of the yellow surpassed that of the blue considerably, and this was in the morning as well as at noon and towards evening.

The only explanation for this is that on the day in question the yellow light in the atmosphere was predominating; for what reason I do not know.

As color-sensitive photography entered at last practical life, I observed that by taking the same objects under apparently equal conditions of weather, the color action of the same plates was remarkably different. Sometimes it happened that a bed of flowers in the Royal Technical High School gardens, which served me for my experiments, and on which I exposed side by side color sensitive (eosine silver) and ordinary plates, gave very striking and at other times much less marked differences between both plates.

Finally, I observed the color action was worst on those days when a peculiar kind of gray light (notwithstanding a half-veiled sun) was predominating, in which the objects appeared without brilliancy.

All these appearances, taken together, show that the intensity of the variously colored light in the atmosphere, even under apparently equal circumstances, is subject to considerable deviations, sometimes the red-yellow, also the green-

* Dr. Vogel sends us a couple of these prints, showing a very remarkable difference in favor of the eoside plate.—EDITORS.

yellow, and at other times the blue light predominating. In the latter case the color effect will be the least prominent.

Quite similar observations were published by the young Mr. Boissonas, who recently died in St. Louis.

It might be of interest to many of your readers that our young Emperor, as well as his wife, the Empress, show a great interest for photography.

The Empress visited, lately, the photo-chemical laboratory of the technical high school, had shown to her a number of interesting experiments and pictures, and admired particularly the photographic views of Jackson in Denver and Watkins in San Francisco. Three weeks later Ottomar Anschütz, the well known instantaneous photographer, and Dr. Hesekei were invited by their Majesties to make a number of experiments. Herr Anschütz presented a large number of military, athletic and zoological subjects, all very artistically produced. He gave, also, an explanation of the "Schnell seher" (finder) in different constructions, invented by him. The model of a finder, in the shape of the stroboscopic disk, for schools and for general use, was particularly liked by the Emperor. Herr Anschütz showed also in the zootrope a flying uher (owl), a running dog, fencing soldiers on horseback, athletic exercises and some comic scenes. His interview terminated with a conversation about the scientific and artistic value of these instruments.

Dr. Hesekei was about one hour and a half with the Emperor, and at the latter's request he executed, practically, several magnesium flash-light exposures with the Fulgur apparatus. After his Majesty was given the opportunity of seeing the production of such a view he consented to have his own portrait taken, and expressed his high admiration for this style of photography, enabling the artist to do his work also in unfavorable weather, and reproduce oil paintings with great facility. Their Majesties could not enough praise the platinum pictures, and the Emperor gave it as his opinion that the tone of the platinum pictures was much handsomer than that of the ordinary silver prints.

ENGLISH NOTES.

THE Crystal Palace Exhibition is over, and the first award of the National Challenge Cup has been made to the Birmingham Photographic Society, which sent in the largest number of frames (126) by the largest number of workers (26 individuals), the exhibitors being amateurs (with only one exception), and their pictures the result of the previous season's work. On these grounds, coupled with the good average merit of the photographs shown, the judges made the award to Birmingham; and it is greatly to be regretted that another society has since then been writing hysterical letters to the photographic press, and even threatening legal proceedings! When it is remembered, however, that this objecting society was represented in the competition almost wholly by professionals, and that they had beaten up a large part of England in order to induce noted men to join their ranks with the view of winning this cup, we can understand how deeply they must feel the loss of an honor of which they had made so "cock-sure."

The cup was formally presented to the Birmingham Society at a dinner held on April 21st, and its home for the coming year will be the Municipal Art Gallery of the "hardware village." Should it be won three years out of seven by any one society, it will become their absolute property.

I congratulate my American friends on the success of their representatives at the exhibition recently held at Newcastle-on-Tyne. Mr. J. G. Bullock takes an extra bronze medal in the landscape class for some views at Kinco (where "Kinco" may be I have not the slightest idea); Mr. R. S. Redfield gains an extra silver medal in the genre class for "Victuals and Drink," a charming brace of pictures of a little girl attacking a basin of bread and milk; and a silver medal for the best series of six (landscape) lantern slides; and, lastly, Mr. C. R. Pancoast, of Waterbury, wins a silver medal for architectural studies.

The number of photographic societies in the British Isles now approaches 200, and of these there is scarcely one which does not hold one or more annual competitions. In most cases this is exhibited to the members of the society; but all the important societies have exhibitions open to all comers. Of the great benefits resulting from a well-managed exhibition there is no need to speak here. I should be glad, however, to see more pictures cross the Atlantic in each direction. To secure the co-operation of exhibitors at a distance the details of the exhibition should be published six months beforehand; and the local authority should provide frames in which photographs that have to "cross the water" could be placed for hanging. Liverpool is making arrangements for a very big exhibition next year, and I am glad to hear that it is proposed to work on the lines suggested above. I shall hope to see the photographers of the United States represented as they have never before been represented on this side of the Atlantic.

Mr. Henry Sutton—who has just arrived from Australia—sends me specimens of what he believes to be "the greatest advance in process work." The specimens, which are reproductions of oil paintings, are certainly good, and give half-tone without the "network" of lines which we see employed in most photo-mechanical processes. Mr. Sutton tells me that his process is not etched work, than which it is many times deeper; the use of bitumen and bichromates is discarded; the cost is about four cents per square inch, and the resulting block is a copper electrotype. In from three to seven minutes after the fixing of a gelatine dry-plate, the image can be converted into a relief mould, ready to hand to the electrotyper.

If this process turns out to be all that is promised, it will enable those who write for the press, and are also photographers, to illustrate their articles in a very convenient way indeed.

I spent my Easter holiday at Plymouth, the famous seaport which stands at the junction of the two counties of Devon and Cornwall. The coast scenery there is lovely; the fishing villages abound in excellent and willing models, while a few miles inland there is the broad expanse of Dartmoor with its rocky "tors," secluded valleys, and—an anti-climax indeed—the convict prison at Princetown, nearly in the center of the moor. I regret to say that the hand camera which accompanied me "went wrong;" it had been all right when used in a large town, but the brilliant light by the seaside managed to find its way, by repeated reflections, round the shutter, and the plates exposed showed each a black mark in the center. The entering light could be plainly seen when the back of the camera was opened, and the eyes placed there beneath a focusing-cloth. Yet on return to the duller atmosphere of town, no stray light could be seen when this experiment was repeated. But when a piece of magnesium ribbon was burnt in front of the camera, the entering light was very distinct. I

commend the latter test to every one who wishes to make sure of the "light-tightness" of his camera. I doubt if one instrument in ten would stand the test.

Messrs. R. W. Thomas & Co., the well-known plate-makers, have just held in London an exhibition of work done on their plates, which was of high average quality. Gold medals were awarded to R. W. Robinson and E. G. Lee, and silver medals to F. D'Arcis, J. B. B. Wellington, H. D. Arnott, G. Towler, W. Jerome Harrison, R. H. Lord, Auty & Ruddock and A. A. Carnell. As a user of Thomas's plates for many years, I have found them uniformly excellent, and their lantern-plates are probably the most popular in Great Britain.

Mr. Andrew Pringle, who has had great experience with the optical lantern, recommends four-inch condensers as the best size for the lantern-slides used in England (which measure $3\frac{1}{4} \times 3\frac{1}{4}$ inches), but if all the slides used are mounted with circular marks, condensers of $3\frac{1}{2}$ inches in diameter are to be preferred, because—being of shorter focal length—they give more light. The lime should not be brought nearer the condenser than $2\frac{3}{4}$ inches. Mr. Pringle considers that lantern bodies are made far too large—"cottages" he terms them; and he exhibited a lantern recently at the Camera Club which measured only $7 \times 6 \times 5\frac{1}{2}$ inches. The best screen he considered to be one made of canvas, faced, and painted with zinc white; it should be mounted on a roller.

Mr. W. Willis, the inventor of the platinotype process, is continually seeking to improve and extend it. He recommends a trial of a quarter-pound each of oxalate of potash and biphosphate of potash dissolved in 50 ounces of hot water, as a developer in the hot bath process, instead of the oxalate of potash alone, which is generally employed. It should be used at a temperature of 120 degrees Fahr. If a lower temperature than this—say 100 degrees Fahr.—be employed, development is so slow that it can be watched and arrested when desired; but the "quality" of the resulting prints is scarcely so good as when the hotter developer is used. Printing on fabrics by the cold bath platinotype process is simple and most interesting. A material called nainsook, which is made entirely of cotton, gave exquisite results, and Willis writes: "The print (or nainsook) is simply marvellous in its intensity and purity. I have never seen quality to approach it. In looking at this print the surface or material fails to impress itself, and the effect seems to be one of pure light and shade, almost ethereal.

* * * Had I a love for medals I would make an attempt with nainsook as my main-sheet."

The following mountant is strongly recommended for delicate prints, etc.: Weigh out 2 ounces of the best arrowroot; mix it into a thick paste with 2 ounces of hot water, and then add 18 ounces of boiling water, stirring briskly. Soak half-an-ounce of gelatine in water until it is thoroughly soft and swollen. Stir this swollen gelatine into the hot arrowroot, with which it will quickly incorporate itself. Add ten or twelve drops of pure carbolic acid. This forms a stiff jelly when cold, and it should be used cold, being brushed on to the back of the prints or applied to them with a sponge.

The increased consumption of celluloid has produced its natural effect, a cheapening of the raw material. The new price-list sent me by Messrs. Guiterman & Co., of London and New York, shows that transparent sheets of this beautiful material the two-hundredth part of an inch in thickness, and measuring 20×30 inches, are sold for half-a-dollar per sheet. The thickest transparent

sheets quoted are the one-fiftieth of an inch in thickness, and these cost one dollar and eighty-four cents a-piece.

Every one will be glad to hear that Dr. P. H. Emerson has published another of his photographs. This one is entitled "Breezy Marshland," and has been photo-etched by Walter L. Colls. It was "taken direct," and the dimensions are 22 x 15 inches. It represents a road across one of those flat Norfolk plains which Emerson loves so well; a loaded cart forms the main feature of the picture, and its "atmosphere" is delicious. We do not know the special agent for the sale of this fine work, but doubtless it could be obtained through Sampson, Low & Co., the firm which has published all Dr. Emerson's books.

Is it not surprising that the average photographer takes such small pains to adorn the walls of his dwelling with the *chef-d'œuvres* of the masters of his art? The best works of Emerson, Robinson, Rejlander, Donkin and others can be obtained for a few shillings apiece, and their daily study and contemplation would exercise a most valuable effect. It is only the facility of reproduction offered by the photographic negative which causes the price of high-class photographs to be so low. Were this not so, the works of the men mentioned above would be worth hundreds of pounds a-piece. A belief in the educative influence of good photographs has led me to strive to ornament my walls with the work of our recognized leaders, just as the connoisseur in paintings loves his Rubens or his Millais, or the print collector his Bartolozzi. That every reader of the BULLETIN should "go and do likewise" is the advice of

TALBOT ARCHER.

TRANSPARENCIES.

BY P. C. DUCHOCHOIS.

(Continued.)

GELATINE dry plates specially prepared for transparencies are found in the market. They are worked with alkaline pyrogallol, hydroquinone or eikonogen, but preferably by the ferrous citrate developer. The following formula is due to Captain Pizzighelli:

A. Dissolve 600 grains of citric acid in $4\frac{1}{2}$ ounces of water, and neutralize with aqueous ammonia. If too much ammonia be added, it should be driven out by heat. Then 400 grains of citric acid are added and the solution diluted to make up 9 ounces in volume.

B. A ferrous sulphate solution 1 : 3, slightly acidified with sulphuric acid to prevent its oxidation.

C. Sodium chloride solution, 1 : 30.

To develop, take—

A	10 parts.
B	5 "
C	1 part.

REMARKS.—Sodium chloride is a powerful restrainer. It should be employed cautiously. Ferrous sulphate in a greater proportion than that given retards the development. By diluting the developer, softer pictures and less intensity are obtained. Gallic acid acts as an accelerator. It produces sepia tones, generally; in the above solution $2\frac{1}{2}$ parts of 1 : 100 solution may be added.

Excellent transparencies are certainly made by the processes above described, but as a rule they are inferior to those which can be obtained by the continuous action of light. Of this, one may satisfy himself by comparing an albumen

print, for example, with a transparency by development from the same negative, the latter exhibiting, especially by projection, a more or less snowy appearance, from the lights being more or less devoid of their delicate half-tints, while the shadows are unusually intense and equally wanting in details. These defects are inherent to all the positive developing processes, and can be avoided only with negatives of exactly the right kind. In printing by the continuous action of light on plate glass prepared with a collodio-chloride emulsion, much better transparencies are made, but still not as perfect as by the carbon printing process. This process is simple enough. We advise photo-engravers in half-tone on copper plate (photogravure) to try it, as for them it is of the utmost importance to obtain as perfect a diapositive from the negative as it is possible to make. The carbon process has, besides, many advantages: the image is always free from halation, exactly of the same size as the original, and the intensity is easily reduced or can be strengthened without danger of fogging and of filling the lines; in a word, the shadows always remain clear.

Years ago (as far back as 1862, I think) there was in the market a paper called "photodiaphane." It consisted of a film of albumen, which became detached from the paper, while the image was toned, or generally fixed, thus allowing one to transfer it on to any material. We have with the photodiaphane paper produced very good stereoscopic transparencies, for which we had then a ready sale. It was sold in this country by Messrs. Anthony and manufactured in England. It is no more in the market. To replace it we have devised the following process:

A sheet of paper is immersed for three minutes in the whey of milk in which a little gum arabic is dissolved. When dry the paper is cut in pieces somewhat larger than the negatives, and the margin edged with albumen or India rubber varnish, which dries in a short time, then coated with collodio chloride emulsion prepared with a small quantity of castor oil, and proceeding afterward in the usual manner, with this exception, however, that the proof should be printed much darker. When fixed and washed, the proof is sponged between blotting-paper, trimmed beyond the safe edge, and while still damp carefully squeezed into perfect contact on a plate previously prepared with a substratum of alumed gelatine softened before use in tepid water, when the paper is stripped off, leaving behind the image transferred on the plate.*

The collodio chloride to print on paper or on plates of glass is prepared according to the formula:

Silver nitrate.....	80	grains.
Pyroxyline.....	50	"
Ether.....	3½	ounces.
Alcohol.....	4	"
Water.....	1	dram.

Dissolve the silver nitrate in water and alcohol by the aid of heat; add the pyroxyline, then the ether and shake well to dissolve. To this add in small quantities the following collodion prepared beforehand, then add one dram of a 10 grain solution each of lactic and citric acids in alcohol, and lastly two drops of aqueous ammonia:

Chloride of magnesium.....	20	grains.
Pyroxyline.....	50	"
Ether.....	3½	ounces.
Alcohol.....	3½	"

*E. & H. T. Anthony & Co. are the agents for the sale of the materials used in the carbon process.

The plates should be fumed before printing. The toning solution consists of—

A. Ammonium sulphocyanate.....	2 drams.
Sodium acetate.....	1 dram.
Chalk, powdered.....	1 “
Water.....	1 pint.
B. Gold terchloride.....	3 to 5 grains.
Water.....	10 ounces.

Mix B with A, let stand for a few hours and filter. The proofs are fixed with sodium thiosulphate.

To print in carbon we select the brown tissue of the autotype C° and sensitize it by immersion into a solution of potassium bichromate at 3 per 100 of water, then squeeze it upon a plate waxed, coated with a thin layer of plain collodion and immersed in water until it no more repels water. On this the tissue is allowed to dry spontaneously, and for use stripped off and cut in pieces a little smaller than the plates upon which the image must be transferred.

The tissue so prepared is practically of the same sensitiveness as the ordinary silvered albumen paper. Consequently the time of exposure can easily be ascertained by printing a test proof on the latter.

As usual, the negative should be bordered with black or non-actinic paper upon which rests the bichromated tissue, in order to reserve a safe edge, as it is termed, and the frame is covered with tissue paper, especially in printing in sunshine.

The plate upon which the image is developed must be prepared with a substratum insoluble in warm water. A solution of 1 ounce of gelatine in 12 ounces of water, to which have been added from twenty to thirty drops of a 30 grain solution of chrome alum, answers quite well.*

The development is effected in water heated to 120 to 130 degrees Fahr., and after developing a weak solution of chrome alum is flowed to fix the coloring matters and the plate rinsed in cold water.

To reduce an over-printed proof very warm salt water is used. To intensify and tone the method depends upon whether the transparency is intended for projections, for printing or enlarging. In the former case the following is excellent:

A. Ferrous sulphate.....	20 grains.
Alum, common.....	5 “
Water.....	10 drams.
B. Gallic acid.....	15 grains.
Alcohol.....	30 minims.
Water.....	1 ounce.

Mix in equal volumes just before use, and flow the proof with the mixture: a bluish black precipitate is formed. The action should be stopped by washing copiously a little before the desired effect is produced, for in drying the color darkens and tends to a violet. Oxalic and citric acids dissolve the dye. They can, therefore, be employed as reducing agents.

In the latter case, that is, for printing or enlarging, the proof is intensified by a weak solution of potassium permanganate. The color is then olive and turns to a brown sepia by flowing the plate—well rinsed of course—with a solution of pyrogallol, and to a black by substituting gallic acid for pyrogallol.

* It is advisable to clarify the gelatine solution before adding the chrome alum.

[From Photographisches Wochenblatt.]

CELLOIDIN PAPER.

BY DR. A. MIETHE.

To increase the number of the various kinds of chloride of silver papers at present in the market seems not advisable. There is no essential difference in their quality. The best of them, the Obernetter paper, shares with its competitors a number of properties which limit its practical application, no matter how fine the results are in some instances. The new chloride of silver-celloidin paper of Dr. Kurz, of Weringerode, differs so essentially from all other similar products, that even a first trial is surprising. I have made some experiments with a sample of this paper, and will give you the results herewith. The celloidin paper has a faintly glossy, almost mat surface, so that one might believe that it could give no prints to resemble the gloss of the albumen paper. This, however, is not the case. The finished prints have a gloss as fine as any Brilliant paper. The film possesses a strong resistance, is thin and hard, and the paper can be dried between blotting paper or by artificial heat. The treatment is extremely simple. The printing is done in the ordinary way, but so deep that the shadows show a bronze tone. The sensitiveness is very great; on a dark day I obtained under a medium dense negative good prints in thirty to forty-five minutes.

Regarding the negatives, they should by no means be weak, as for aristotype paper, but just in the same condition as for albumen paper. A negative which gives satisfactory prints on albumen paper will do the same thing on celloidin. This is a great advantage, as all chloride of silver papers heretofore known printed more or less hard.

The pictures come directly into the toning fixing bath from the printing frame. The bath is composed of the following:

Hypsulphite of soda.....	500 grams.
Ammonium sulphocyanide.....	55 "
Alum.....	15 "
Chloride of gold solution (1 : 200).....	225 c.c.
Acetate of lead.....	20 grams.
Water.....	2,000 c.c.

The fixing and toning lasts about eight minutes. The pictures assume a magnificent purple tone, while the high lights appear brilliantly white. The tone does not change much during drying, and the toning has to be continued until the desired color is obtained. Two colored prints are not obtained; the lightest and deepest shadows have exactly equal color. A little inconvenience is, that the prints will not lie flat in the tone-fixing bath; they curl a little toward the film side, and a sufficient quantity of solution should therefore always be used. About the durability of the fixing bath I have no experience yet. I have found that still handsomer tones are obtained if less gold is applied. A fixing bath of the following composition seems to give the best results; the toning lasts somewhat longer (about ten to twelve minutes):

Hypsulphite of soda.....	250 grams.
Ammonium sulphocyanide.....	20 "
Alum.....	10 "
Chloride of gold solution (1 : 200).....	80 c.c.
Acetate of lead.....	5 grams.
Water.....	1,000 c.c.

Many pictures can be toned at the same time. The whole manipulation is less delicate than with aristotype paper, the film appearing to be almost indestructible. In a dry state, however, it will break when bent sharply.

The washing is undoubtedly much quicker than with chloride of silver gelatine. The pictures should be mounted when still in a moist condition.

The simplicity of the treatment (only one bath), the handsome high lights and magnificent tone, its comparatively cheap price, and the soft, easily burnishable prints make the chloride of silver celloidin paper a very recommendable article for practical photographers as well as for amateurs.

[From the *British Journal of Photography*.]

SOME FALLACIES ABOUT RESIDUES.

It might be thought that this subject had been treated sufficiently fully and frequently to need no more attention being given to it for some time to come ; but we have recently had proof that such a view would be erroneous. Possibly the continual accession of new recruits to the ranks of the amateur photographer may have something to do with the matter. There was lately sent to us—we write with it before us as a kind of text whereon to found a useful discourse—a printed set of instructions from an assay office, appealing to photographers, in which occur several recommendations that are fallacious, and the following of which would give needless trouble.

We read that “films from dry plates are of no value.” If the assayer meant to say were not worth the cost of reducing, he might be within his own province in giving such a dictum, and might be correct ; but, as a matter of fact, there is in a dry plate an appreciable, if not a large amount of metallic silver. It is stated that ammonia, hypo, or cyanide, prevents precipitation of the silver from print washings. The latter two chemicals truly have that effect, though the caution should be given that, in case of such an accidental admixture occurring, the plan to adopt would be to add the contaminated washing water to the hypo waste ; there would then be loss. But as to ammonia preventing precipitation, this is a complete fallacy. It is founded upon another fallacy, namely, that common salt is the best and cheapest material to use for precipitating chloride of silver from waste nitrate solutions. So far is it from being a fact that ammonia prevents precipitation, as, for example, in “ammonio-nitrate” solutions of silver for printing, etc., that the very opposite may be said to be true ; for when the most suitable precipitant—hydrochloric acid, known also as spirit of salts, or as muriatic acid at the drysalers—is added, it at once neutralizes the ammonia, and forms chloride of ammonium, any excess of silver being thrown down as chloride, and in a form far more easy of treatment than when common salt—chloride of sodium—is used.

Those who recommend this latter substance for the purpose forget that chloride of silver is soluble in a solution of chloride of sodium, which, indeed, has so considerable a solvent action as to have led to its use as a fixing solution for prints before “hypo” came into use. Hydrochloric acid has no such action, and it can be bought at a ridiculously low figure.

Another fallacy, almost universal, in connection with chloride of silver is that zinc is the most suitable metal to use when it is desired to reduce it to the metallic state where it is intended to dissolve the silver for after use. True, zinc is cheap and easily obtainable, but iron is still cheaper, still more easily obtain-

able, and is better for the purpose. We state from our own experience, and on the authority of a chemist having the management of an important assay office, that iron is far better than zinc, from the greater readiness with which the last trace of foreign metal is removed than when zinc has been employed. Probably almost every one who has had a little experience with the reducing of chlorides—always an interesting subject to the photographer with chemical knowledge—will, as a matter of course, use carbonate of soda as a flux; but it is quite a fallacy to look upon this as a typical reducer. A mixture of chalk and charcoal forms an excellent material wherewith to mix the dry chloride before placing it in the furnace. Some of the earliest experiments we ever took part in were made in a blacksmith's forge, the crucible being placed in the fire and the bellows urged until our silver lay at the bottom of the vessel. But even here, with every facility to observe the action and decrease the heat when wished, there was considerable difficulty from the tendency to intumescence displayed by the contents of the crucible.

Here *en passant* we may note that where reduction by the use of alkaline carbonates is adopted, the substance to use is the crystallized carbonate, not the so-called bicarbonate or sesquicarbonate of the shops.

We are inclined, however, to believe that the greatest fallacy of all in connection with residue reducing is that of attempting, when the material is not on a manufacturing scale (except as a single experiment or two done for the purpose of obtaining knowledge), to bring the residues into the metallic form before obtaining value from the refiner. We have lately been afforded the opportunity of going over the list of assay notes received at periods extending over a long space of time by a well-known professional photographer; and we note that although at one time he did not even go to the trouble of having his paper clippings and old filters burnt, the general average of cost in having reduced paper chlorides and sulphides was, in round numbers, 5 per cent.

This sum, it must be remembered, included all chemicals employed, the cost of labor and fuel, of crucibles, and the risk of waste, which in unaccustomed hands is very considerable. For example, we were once appealed to for help by a gentleman who had been reducing his own residues to the metallic state and had met with a misfortune. He had a very large crucible full of flux and metal, but as the whole was not quite limpid he gave a little more time and a little more heat. In a while he again examined the result, and thought the bulk had diminished, a thought soon reduced to a certainty. The crucible had cracked, and the contents were oozing away before he removed it. We told him all he could do was to collect the ashes from the furnace and get the metal from them. He informed us there were about two bushels of ashes. The whole mess was sent to the refiners, but we never heard the result; possibly the balance was on the wrong side. We may safely predicate that this batch of residue was not reduced for so small a cost as 5 per cent.!

PHOTOGRAPHY IN COLORS.

BY CAPTAIN W. DE W. ABNEY.

(Presidential Address before the Camera Club Conference, London.)

In opening this conference I have taken on myself to utter a few of the thoughts to which such meetings as this tend to give rise. I remember the time, as can many more who are here, when photography was fettered by difficulties,

when its amateur devotees might be reckoned by tens instead of thousands, when the feat of producing an artistic photograph was something to be proud of, and when its scientific aspect was studied by not as many people as can be counted by the fingers on my two hands. How changed is this now! We have thousands going in for the art side, and a fair sprinkling, though not enough by any means as yet, of students who engage themselves on the scientific side of photography. As these conferences have very well shown, chemistry, physics, and mathematics have all their place in photographic science, and by many the science of imagination is also strongly brought into play; a very useful science, too, when controlled and not controlling, which last, alas! is too often the case. Now, I am going to take advantage of my position to-day and ask you to follow me in utilizing the imagination. In a sermon the preacher has it all his own way, and the only relief to the feelings of those who disagree with him is that they may discuss it outside the portals of the place of meeting, and disagree with the oration to their heart's content. My address I believe to be similarly privileged, and I seize the opportunity of uttering something which has long been in my mind.

Though we know not the "reason why" of color sensation, we yet know that there are three distinct color sensations, the existence of which I have heard so eminent a physicist as Lord Rayleigh say is as well proved as the law of gravitation. I may add that I am one who boldly accepts the theory of trichromatic vision in a normal eye, and hold it as being sound physiological physics. But what has this to do with photography? Just this, that the same theory that applies to the sensitive retina may equally well apply to the sensitive plate. The eye, *i. e.*, its retina, is sensitive to three primary colors, red, green, and violet, and if we take the spectrum we find that any intermediate colors can be compounded of two or more of these three colors. Thus the orange sensation is caused by a combination of the red sensation with green sensation, and the blue of violet and green. Further, when we come to show graphically on paper the curves of luminosity of the three different sensations to the spectrum, we cannot but be struck with the similarity that they bear to the curves of sensitiveness of the different salts used to register the photographic image.

There is no difficulty in taking in the fact that some one particular wave-length can cause one sensation in the eye, but it is harder to understand that another wave-length not differing much from it can give rise not only to the same sensation, but to one or two others. The theory of sound, however, helps us in the first case. When one tuning-fork is not quite in tune with another, the one sound from one will reinforce the other to a certain extent, but as the discordance increases the reinforcement becomes less and less and finally vanishes altogether. So with waves of light, the waves which are in exact accord with one part of the machinery (whatever it may be) in the eye will produce a maximum effect, producing eventually a motion which gives rise to the impression of a primary color. The waves which are slightly longer or shorter than this will be only capable of giving a smaller amplitude of vibration to the same part of the apparatus existing in the eye, and consequently less intensity of that particular color sensation, till finally, as the wave-lengths become shorter and longer, the amplitude of vibration in that machinery becomes nil or imperceptible. But at the same time that part of the machinery which is exactly in accord with another wave-length, and is, consequently, another color sensation, may also

respond to the same wave-lengths as those which partially affect the machinery answering to the first color sensation and for the very same cause, though it may be to a greater or less degree. Thus the same wave-length, which is not in true accord with either, may cause both color-perceptions to respond. The same argument applies to three color-perceptions, and would do so to more if they existed. Now a sensitive plate may be said to take the place of the retina, and the sensitive salts used to a color-perceiving tissue. The simple salts have but one color-perception, but where two salts are mixed, we may have two perceptions, and when dyed plates are used, we may have two or three color-perceptions. Even where one sensitive-salt, the silver bromide, has been used, I have traced three distinct color-perceptions, or, to speak more accurately, radiation-perceptions, one situated in the violet, near G , another in the green, between F and E , and the third in the red, and extending into the infra-red. The places of maximum sensitiveness in the three correspond to three simple color-perceptions, but not situated in the same place in the spectrum as those of the eye. These curves, however, differ from those of the eye color-perceptions, in that whilst the curve of luminosity of the spectrum arrived at by compounding the latter is a smooth curve, the former is not; but the curve of photographic sensitiveness is in a series of hummocks or ridges. We can find something similar in some eyes; for instance, where there is a slight deficiency in the perception of green. Again, there is this difference, that whilst in the eye the luminosity curves of the red and green are the greatest, and the violet the smallest, in the silver bromide the violet is the largest, and the green and red the smallest. In fact, when the color-perceptions of the eye are altered in their proportions, by looking through a pale blue solution, they are very much the same as those of the photographic film already alluded to. It may be asked how and what am I driving at, and my reply is, that I think that the photographic spectrum curves of sensitiveness are analogous to the spectrum curves of color-perception in the eye, or, in other words, that a photographic plate has, in reality, only one, two, or three color-perceptions, and that all sensitiveness to other colors is due to only partial response of the vibrating atoms in the molecule to wave-lengths, which differ slightly from those with which one or more perception is in accord. A study of the simple mixture of the haloid salts favors this view, and I believe that by using it as a working hypothesis, a better understanding of the apparent vagaries in the extent of sensitiveness will be attained.

I would here add that the generally adopted physiological interpretation of color perception is one which is very open to discussion. It can scarcely be conceived that even the delicate rods and cones of the retina are not much too coarse to be primarily affected by waves of light. In the ear there is an equally delicate mechanism which is affected by vibration in the air; and we can scarcely expect the mechanism in the eye to be responsive to vibrations infinitely more rapid, and in a medium infinitely more subtle. Probably it will eventually be found that light acts on matter to produce a chemical change in it, and that the change so produced is capable by electrical currents to set in motion the mechanism required to give the sense of color. This, however, is traveling beyond the limits I have set myself to keep, and I leave it there.

I have to ask those of you who are interested in theory to take this hypothesis into your consideration. My late researches into the sensitiveness of various

compounds recently published by the Royal Society have made me offer it to this Conference.

Quite recently we have had an announcement that a Herr Verescz has achieved photography in natural colors, and that it is a printing process. In the paragraph which appeared in the *Standard* the name of Dr. Eder appears as supporting the discovery. Were it not that the statement in some degree has received an imprimatur by such a name being connected with it, one would at once have discarded it as one of those periodical outbursts of journalistic credulity which are so often rife at certain seasons of the year. There is one thing which is admitted, viz., that although red and orange have been secured, they fade in the light.

Now, as I pointed out in my address to section A of the British Association, photography in natural colors is a *fait accompli* of many years standing, but the process is so long, and the results so evanescent in light, that there has been no practical use of the discovery so long ago made. Before we can hope to attain the goal to which so many have tried to reach, at least two things have to be accomplished—the first, diminution in exposure of the sensitive surface, and the second, a means of preventing the print fading in white light, which is commonly called fixing the print.

That the first may be done, I will not deny, but I think a glance into the physics of the matter will at once demonstrate that the second desideratum is chimerical, for the following reasons :

There is no known element which is capable of taking on itself three colors, owing to molecular change, and this would be the least number of states in which it must exist to reproduce all the spectrum colors. We may, therefore, at once dismiss from the possibilities that a printed image in colors can be composed of elemental matter. This makes the possible image a compound, which has to be acted upon by light. The action that must take place on such a compound must be either a reducing action or an oxidizing action (probably both), or else a molecular rearrangement. In the case of chloride of silver, which after a preliminary exposure to the light, can be impressed by the spectrum colors, I have found that the blue end of the spectrum is reproduced by reduction, and the red end by oxidation, there being a position where there is a combination of both. We can conceive matter to be so composed molecularly, that colored light may sift out certain molecules, which shall in the aggregate reflect red light when the rays acting on them are red, or when green light acts on them reflect the green rays, and so on. Let us fix our attention on the molecular aggregations which reflect red light. Since red light is reflected it follows that all the rays existing in white light are absorbed, except the red rays, and we know that when absorption takes place then internal work of some kind must be performed. In the spectrum, where these colors are produced on the sensitive surface, it must be recollected that no blue light acts on the part exposed to the red rays, and is therefore, during that exposure, incapable of doing any work in the molecules. Now the very fact that the molecules are ready to arrange themselves into aggregations reflecting different colors, show that they are very susceptible of taking a new form of aggregation, and those which had aggregated into red reflecting masses by the action of the spectrum would be the first to re-arrange themselves into blue reflecting aggregations when acted upon by the blue rays which they absorb. The blue reflecting aggregations would also be the first to

re-arrange themselves as red reflecting aggregations under the action of red light, and so on. Red, green, and blue reflecting aggregations, arrived at by exposure of the matter to the spectrum colors on subsequent exposure to white light, which is a combination of the three colors, must, therefore, rapidly change to a neutral tint, following out the above reasoning; and this is found to be the case in the photographs in natural color taken up to the present time. We may take it then that no mere re-arrangement of molecular groupings by colored light can remain stable in white light. Let us see if there is a probability of fixing the color by chemical means. Fixing would mean removal of some matter still sensitive to light. As from the nature of things, such matter is part of the molecular aggregation which causes the color to be reflected, it is evident that the removal of a part of such aggregation must at once change the color. If fixing be attempted by adding to the molecular aggregation, the same reasoning applies. We therefore are in this quandary as to a printing-out process in natural colors. If the color be produced by change in composition of the matter acted on, it must be fixed by chemical agencies, which means destruction of color. If it be formed by altered molecular arrangement, white light must of necessity alter its color.

A process in natural colors which depends on development is out of the range of probability, as I have already stated in my British Association address. An embryo photographic image in natural colors might be possible, but to imagine that a colored image can be built up by chemical means, such as by the deposition of silver on such image, is to endow the depositing atoms with a discriminative judgment, which, so far as is known, not one has the slightest symptom of possessing.

It will be seen from this that I am no believer in the discovery of a really practicable process for producing photographs in natural colors. We may wish every success to the gentleman who is making these researches, but the telegraphic description in the *Standard*, to my mind, does not require to be read between the lines to see that there is a great deal more of hoped for, than of accomplished, success in what has been done.

PHOTOGRAPHY, ITS HISTORY AND APPLICATIONS.

BY F. J. HARRISON.

Lecture before the Young Men's Christian Association, New York.

TRACING photography from its earliest infancy, describing the work of Niepce, Daguerre, Fox-Talbot, Davy, Scott-Archer, Maddox, Abney and others, the lecturer compared, in a few chosen words, the present state of photography with that of the past. Dismissing the processes of Niepce and Daguerre with allusions to the time required and the expense and the unsatisfactory nature of the results, he summed up the objections to the collodion process by saying that the would-be photographer must prepare his plates on the spot and expose and develop them at once. This necessitated the carting around of a moderate-sized express wagon, to say nothing of the staining effects of the chemicals. The modern dry plate can be purchased anywhere, all ready for use, for a few cents. It may be exposed, carried home and developed, or development postponed until any convenient time. The photographer need carry nothing but his camera and a stock of plates, the weight depending upon the size of his

outfit. If plates are too heavy for him, celluloid films are at his disposal, and thus equipped he may travel with no more inconvenience than if he carried an ordinary handbag.

Speaking of the applications of photography, he proposed the question: "Do the results achieved, and achievable, by photography justify the time and labor expended upon it?" His following remarks fully impressed his audience of the vast value of our art science.

Alluding to its use in illustration, he said: "Take your newspapers—they each have a photographic department, and do not consider the rather considerable outlay incident to it as gone to waste. Pass to your weekly and monthly periodicals, your *Illustrated American*, *Harper's*, *Scribner's*, *Century*, etc., they are all indebted to photography for their most pleasing and instructive feature, their illustrations. After describing the general principles of the methods employed, he discussed the uses of photography to the astronomer and the spectroscopist, exhibiting many beautiful photographs in illustration of his remarks. Its uses for military purposes and for surveying were touched on, and Anschutz's method of photographing a rifle bullet described. Allusion was made to the photographing of the interiors of gas and oil wells, to its use in medical science, to Mr. Muybridge's photographs of animals, to criminal identification, to the artist, the estate agent, the civil engineer, in fact, its universal use and popularity were fully proved.

Summing up, Mr. Harrison said: "In fact, we may say with perfect truth that photography has now become indispensable to the scientist, the mechanic—to every one. Sweep from existence the processes of photography, and there would be a gap it would be impossible to fill. The photograph, with its perfect truth, is within the reach of every one. A few dollars purchases a complete outfit, and the outlay is far more than repaid by the pleasure and instruction it brings to both the worker and his friends."

Speaking personally to the members, he advised them to work at photography intellectually. "Do not work on the principle of I press the button, and some stranger, ignorant of the circumstances under which my plate was exposed, does the rest, but work at it intellectually, studying and understanding each move. Nowhere else, perhaps, do there exist such facilities for forming a social photographic society, and continuing the work begun by Niepce and Daguerre. Do we not owe a debt to these men? Are we to rest on our oars content? No! Let us take up the thread and carry on toward perfection the beautiful process which has been bequeathed us by our ancestors."

Quite an ovation greeted the speaker at the close of his remarks. A flash-light picture of the audience, which numbered some 250, was taken in illustration of the possibilities and progress of photography. We understand that a camera section has been added to the numerous useful departments of the Association. We wish it every success, and hope to hear from them from time to time.

A CORRECTION.

ON page 263 of last BULLETIN, in the formula for silver pyrogallol developer, read "silver nitrate 10 grains" instead of 1 grain. P. C. DUCHOCHOIS.

INCLOSED find subscription to BULLETIN. Send it right along, I can't get along without it. J. R. SWAIN, Indiana.

THE SALTING AND EXCITING OF DRAWING AND OTHER COMMERCIAL PAPERS.

BY LIONEL CLARK.

(Continued.)

DISCUSSION.

Mr. AUSTIN asked as to the temperature of the sizing solution when used.

Dr. PATTERSON inquired how long the salted paper would keep.

Mr. MASKELL said that he had always used the sizing solution cold, as he used as little as three grains of gelatine to the ounce.

Mr. CLARK replied that for rough papers it was advisable to use as much as twelve to fifteen grains gelatine per ounce, for smooth paper very much less.

Mr. SHIPTON congratulated the lecturer upon having given one of the most interesting demonstrations of the present session, and one in which only one thing was lacking—viz., a table of curves! (Laughter.) They were so accustomed to a table of curves when Mr. Clark addressed them that he, for one, felt quite unhappy at its absence. (Laughter.) Joking aside, however, there could be no doubt that very artistic results were procurable by means of rough-surfaced papers, such as had been placed before them that evening. Specimens of prints of a somewhat similar nature were on view at the exhibition of the "parent" society a few weeks since, and by many were much admired. Those specimens suffered somewhat by being massed in a single frame, and by being toned in too warm a color, but their merits were unmistakable nevertheless. The chief characteristic of rough-surfaced prints was a delightful softness—a softness that would cheer the heart of even the high priest of the naturalistic school—(laughter); and, at the risk of error, he would broach the theory that this was due to the breaking up of the lines of the picture, so to speak, by allowing the negative to come into contact with the paper only upon its mountain tops and not down in the valleys. In spite of its many charms, however, he did not think that silver printing on Whatman or any other drawing paper would become popular among modern-day amateurs, if they had to salt and excite their own paper, and take the evident risks of failure the lecturer had referred to. Upon this ground he would, therefore, like to know if it were not possible to coat a very rough-surfaced paper for use by the hot, or, at any rate, by the cold-bath platinotype process. If it were they would add to the advantages of the system demonstrated—the one of permanency, while a choice of suitable tones or colors would still remain; in fact, the only power not retained would be the one to modify the strength of the exciting bath to suit various types of negatives. He noticed the marked difference between the plans advocated by the lecturer and Professor Burton, in that one was for floating the paper, while the other was for immersing it; but granting Mr. Lionel Clark's method to be the correct one, there would probably be occasions when double floating would be necessary. In such a case he presumed that the cost of the process, and not the trouble only, as stated by the lecturer, would be increased. It might not, of course, be doubled, but as to this he should like to know if the second floating might not take place upon a weaker bath? As regards the specimens sent round that evening, he was of opinion that those attached to the fashionable plate-sunk and tinted mount had lost much of their charm in consequence. To be truly effective the paper should be masked, and the picture printed in the center. When this course had been tried, however, the demonstrator seemed to have secured a plentiful crop of degraded whites, which might or might not be due to the process itself. There were one or two other points upon which he would like information. Could the intensification process shown that evening be made available for under-done albumenized silver prints, and was the toning of the rough-surfaced paper optional? Also, was there any choice—as to permanency or color—between prints that had been printed to the required depth in the first instance, and those which had been printed but lightly, and then intensified?

Mr. DAVISON thought they were much indebted to Mr. Clark for his diligent inquiry and experiments. He had gripped the subject and explored it with that

rapidity which was one of his characteristics. He took up a new thing in which he was interested, and in three weeks or less he was a veteran. He (Mr. Davison would prefer to work in platinum rather than in silver, but at the same time he had always wished for good rough-surfaced papers and a command of variety in monochrome. He hoped that such were possible, and would be introduced in platinum printing. However, in several instances the result (as far as appearance went) obtained by Mr. Clark were admirable. He supposed it was useless reviving the old discussion as to the misuse of the word "tone," which photographers so often made do duty for "color." As to the generally admitted artistic effect of rough papers, this was due to nothing more nor less than the loss of obnoxious detail. The roughness could hardly be said to do away with focus equally; it simply softened out the detail everywhere, while retaining the relations of the focus of one plane to another in the picture. As to mounting of these prints, particularly the thicker papers, and, indeed, every kind of print, he thought the best method was to mask out the picture, leaving the paper on which the image was borne as the mount right out to the picture-frame.

Mr. CLARK said, in reply to Mr. Austin, that the salting solution should be used hot, as there was then no danger of the solution drying in gelatinous streaks. In reply to Dr. Patterson, the salted papers would keep indefinitely. In reply to Dr. Shipton, he regretted he had not made some curves for this gentleman's delectation; as a matter of fact, curves were unnecessary, as every difference in gradation of the negative could be compensated for. It was in this power that home-sensitized papers differed so much from commercial papers. There one had the same rigid preparation for every sort of negative, here one had a fresh process of further compensating for any errors of exposure or development. He did not expect that this kind of printing would ever become very popular—it entailed a little trouble; he could not, however, regret the fact very much. It would be difficult for the better class of photographers to distinguish themselves from the common herd if all the best processes were to be simplified down to the tastes and requirements of the modern amateur. He did, however, think that it might be quite possible for dealers to put on the market a really rough paper, simply salted. The operation of sensitizing was so rapid and so easy that it lay within the power of the most ordinary guinea set-pot shotter. Looking at the method of preparation for platinotype papers, he did not think that it would ever be possible to coat evenly a really rough service paper, such as he had handed round that night. He sincerely hoped, however, that it might be done; the platinotype was out-and-out the best process in use, and if really rough papers could be prepared, he for one should gladly avail himself of them. With regard to the purity of the margins, in his examples he found no difficulty in getting pure whites, except just at the edges where the silver solution ceased. This point had invariably a tendency to yellow, and therefore a somewhat larger piece of paper than that actually required should be prepared. He could not say whether his intensification process would apply to albumenized prints, he rather hoped not, and should much regret being the introducer of any plan that would tend to increase this abominable method of reproduction. He did not think that there was the slightest difference in permanency between the printed-out and intensified prints—the image was silver in each case; one was reduced by light, the other was reduced by pyrogallol. With regard to Mr. Davison's criticisms, while thanking him for his compliments, he must protest against the accusation of only having taken up silver printing three weeks. Over two years ago he had read a paper on the subject before the club, and, needless to say, that was not his first acquaintance with it. At the same time, he freely admitted that it was only lately that he had fully appreciated the artistic powers it gave photographers, and his paper that night was especially written with the view of affording to his fellow-members the advantages he saw in the use of ordinary papers to printing purposes.

All communications for the columns of the BULLETIN should reach us on Monday preceding the day of issue, to insure their publication at that time.

ANOTHER WORD ABOUT BLISTERS.

To the Editors of the BULLETIN.

It seems that blisters never die. Having read the letters lately printed in the BULLETIN, I am moved to add my mite.

I have never had but one or two large ones, but have at times run against a beautiful crop of the "pin-head" variety; and after twenty years' experience in the art of "how not to have them," have come to the conclusion that the state of the paper when floated has a good deal to do with their appearance.

I keep my stock in a moderately dry cellar-way. I find that after having been in my printing room long enough to become thoroughly hard and dry, it is not only more difficult to silver, but is pretty apt to produce blisters; while the same paper silvered when first brought in not only works better, but is free from blisters.

Isn't it more than likely that the condition of the paper when used has a great deal to do in causing such diverse opinions?

Let those who are bothered try the above and report.

Yours, for the good of the craft,

MONTICELLO, N. Y.

W. MILLIKEN.

GERMAN PHOTOGRAPHIC EXHIBITION.

THE annual exhibition of the Deutsche Photographen Verein will be held August 27th, 28th and 29th at Eisenach, Germany, under the presidency of K. Schwier.

The exhibition will have a special section set apart for foreigners, and the notice says: "To this all foreigners (non-members of the Deutsche Photographen Verein), especially our American and English colleagues, are hereby invited. Photographs exhibited in this group may have been exhibited elsewhere, but it is desirable that no older work than that of last year should be represented. Contributors to the group are not bound to pay anything for space, but it is earnestly desired that the objects sent in should be left to the traveling care of the Deutsche Photographen Verein, in order that they may be seen by those members of the Society who have not been able to visit the exhibition.

"In this group gold, silver and bronze medals, as well as diplomas, will be offered for prizes.

"In addition to this, especially deserving performances in any part of photography which are not included under any of the above-mentioned, may be especially rewarded by the consent of the directorate.

"The prizes offered by the Union will only be given in cases where the exhibits reach the highest (and not the relatively highest) degree of excellence in their respective divisions.

"The awarers of the prizes will consider in the first place the knowledge of technique and artistically good execution. These features will be of the first importance in all the prize distributions.

"All photographic pictures must be sent in a condition suitable for exhibition, that is to say, in frames or as collections in a portfolio. It is preferable for pictures to be framed without glass, that they may be more conveniently judged.

"Pictures will, in the exhibition, be divided into groups, etc. For this reason landscapes, portraits, etc., should not be mounted in a single frame, but they should be framed separately, every kind by itself."

Preliminary applications must be made to K. Schwier, President Deutsche Photographen Verein, Weimar, Germany. There will be no charge for space to foreign exhibitors. The return of pictures will be at the cost of the exhibitor. Remittances of money must be made to Herr L. Frank, in Eisenach, Germany.

The delivery of the exhibits must be made between the 20th and 25th

of August, at the exhibitors' own cost and risk, to Herr Otto Volpel, in Eisenach. Upon each package is to be marked clearly, "For Der Deutsche Photographen Verein." Every exhibit and every frame must bear upon their backs the address of the exhibitor. Every box and every cover must bear the same address on its inside. The exhibitions will, according to their estimated worth, be insured on the part of the Deutsche Photographen Verein against danger of fire and water. No further accountability will be admitted.

The awarders of prizes, who are chosen according to the statutes regulating the exhibition, consist of nine persons; of these, three are chosen by the directorate. The Traveling Association then announces a list of eighteen persons chosen by acclamation, and of these the remaining six persons are chosen by the exhibitors present. These nine officials are the awarders of all the prizes.

OUR ILLUSTRATION.

THE charming snow scene with which we illustrate this issue of the BULLETIN is from a handsome aristotype print sent us by Professor S. W. Burnham, of the Lick Observatory on Mount Hamilton. The view of the observatory in the distance, through the graceful branches of the snow-flecked trees, forms a picture very seldom seen, and the detail and harmony of light and shade make the illustration one of uncommon beauty. The reproduction by the photogravure process has also admirably preserved the charming characteristics of the original print.

ANTHONY'S PRIZES FOR BROMIDES AND PHOTOGRAPHS FROM NEGATIVES MADE UPON CLIMAX FILMS.

OUR publishers offer the following prizes in competition at the Washington Convention of the Photographers' Association of America, August 12th to the 15th inclusive, 1890, as follows:

1. For the best collection of Plain Enlargements upon Anthony's Bromide Paper, at least six in number, and not smaller than 11 x 14 inches, \$100.
2. For the best Crayon Worked Enlargements on Anthony's Bromide Paper, at least three in number, and not smaller than 11 x 14 inches, \$50.
3. For the best exhibit of Landscape Photographs from negatives made upon Anthony's Climax Films, not less than twelve in number nor smaller than 5 x 7 photographs, the negatives to become the property of E. & H. T. Anthony & Co., \$50.

Competitors must forward their exhibits, prepaid, so that they will reach Washington, D. C., by August 10, 1890.

Prints may be framed or not, at the option of the exhibitor.

Each package must contain a sealed letter stating the name and address of the exhibitor and his private mark, a letter being also sent to our publishers with same private mark only; but on no account must any other than the private mark appear on the pictures themselves. Instruction as to the class in which they are entered must also be given, and the pictures numbered on the back to correspond with the number given in the class entry. Judgment will be given to the distinguishing mark, but the awards will be announced with both mark and name.

Be sure and ship your exhibits in good time, as those arriving late will not be apt to get a good place, and will run the risk of not getting there in time to be entered for competition.

All exhibits will be subject to the Association rules. All art exhibits must be sent to George H. Hastings, Art Department Photographers' Association of America, Washington, D. C. All charges prepaid.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.O.S.
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.**LOWELL CAMERA CLUB.**

THE last regular meeting of the Club for the season was held at Morrill's studio, March 18th, with the largest attendance during the year. The Secretary gave a talk on the composition of pictures, illustrating the subject with diagrams. A letter from the President of the Waterbury Photographic Society was read. It gave a detailed description of the methods used by that Society in producing their slides. The principal things necessary, he said, to get good slides are good negatives, accurate focusing in the camera and a standard developer. These points were discussed by the Club: some preferred to expose the plates with care, and then if the standard developer proved to be too strong or too weak, vary the strength to meet the exposure rather than expose to exactly suit a certain developer. But the excellent slides furnished to the New England Lantern Slide Exchange by the Waterbury Society certainly prove the practical value of their method. These slides were excellent, both technically and artistically considered.

The Hartford Camera Club slides were also shown. The description text entitled: "In and around Hartford," was read, and added much to the interest of the slides.

At an extra monthly meeting of the Club, held April 15th, the slides of the Springfield Camera Club and the Worcester Lantern Slide Club were exhibited. These were the last sets in the exchange, and each of them contained some good work. The slides of one of the Worcester Club were on plates of his own make. The Club voted to continue a member of the New England Exchange for the coming year.

A special meeting was held April 22d. Dr. Moses Greely Parker, a member of the Club, gave a very interesting discourse on lightning, illustrating the subject with his slides, many of which he made from his own negatives, taken direct from the flashes in the sky. He has given much study to electricity, and was the first to show by photography the peculiar rotary motion that the current always takes. As the views were thrown upon the screen he pointed out the motions in the different flashes. He said the electrical current may travel without dividing, or it may divide and subdivide; twist and meander in its passage; its image on the plate presenting such a variety in form that many names have been given descriptive of its general appearance, with no reference to the real motion of the current itself. He designated these motions, the twisted, the curled, and the straightforward. The twisted motion resembles a loosely twisted rope; it twists both ways, usually from left to right, but it sometimes reverses its motion in the same course. The curled motion resembles a twisted ribbon or shaving as it curls from a carpenter's plane, and in some respects is most remarkable. The straightforward presents straight lines in its track, and evidently travels with great force. One of the important practical uses to which this discovery of the rotary motion of the electrical current has been put is in reducing the resistance in wires. Dr. Parker has shown that the resistance is much reduced in wires when twisted to conform to this natural law.

After the lecture Mr. J. H. Weaver, of New York, gave an instructive talk on how to get the best results in photographic work. He demonstrated the method of printing and developing positive films before the Club, and the subject was freely discussed. This meeting will probably be the last indoor meeting of the Club for the season. It is proposed to

hold several field days during the summer, and it was voted to hold an exhibition of photographic work in the fall.

THE NEW ORLEANS CAMERA CLUB.

THE OPENING OF THE MODEL QUARTERS.

FOUR years ago there assembled in the parlor of Mr. C. H. Adams' studio, on Royal street, three gentlemen, Messrs. H. H. Baker, J. E. Macdonald and Dr. W. R. Mandeville, all enthusiastic amateur photographers. Their purpose was the formation of the New Orleans Camera Club, and Dr. W. R. Mandeville was elected the first President, and later on, as more persons joined the Club, Major W. H. Huer was made Vice-President, Mr. H. T. Howard, Treasurer, and Mr. J. E. Macdonald, Secretary.

Gradually the number of members increased, and for some time they had to meet at different places, and were compelled to do their work at their homes or at the gallery of some accommodating professional, but through the kindness of the faculty of Tulane University a dark room was fitted up and exhibitions were given in the lecture-room of Tulane Hall.

As new additions to the membership were made the quarters were found to be too confined, and at a monthly meeting in the first part of the past year a number of bonds were issued and taken up by the members to the amount of \$2,000, for the purpose of renting and fitting up a suitable building for a club-room and meeting-room.

The committee appointed did its work in a thorough manner, and on August 1, 1889, met in the new rooms, No. 3 Carondelet street, and turned over to the Club one of the finest dark rooms in the country, a studio filled with the best apparatus obtainable and a meeting hall as cosy as a parlor.

Such was the rise and growth of the New Orleans Camera Club, and Wednesday evening, April 16th, at an entertainment to its friends, it threw open its rooms and issued invitations to hundreds to assist in a house-warming.

Electricity was freely used to illuminate the rooms. Refreshments were lavishly furnished. As each lady entered the door of the club-room she was handed a ticket entitling her to a finely-finished landscape view or a portrait made by the different members.

Around the walls were hung large frames of polished oak, within which were arranged in tasteful designs hundreds of photographs,

the work of the members, and many were of the highest order of excellence.

The different outings taken by the Club over the several roads furnished ample opportunity for displaying prowess with the camera, and the majority of the views exhibited last night were selected from the results of those trips.

The Club has at present 89 active, 11 honorary and 4 corresponding members on the roll.

The first object of interest in the Club's quarters is the studio on the top floor of the building, a large room with a glass roof and wide front windows, insuring a perfect illumination for portrait work. A portrait camera, with all the latest swings and attachments, with a \$500 Dallmeyer lens, three back-grounds of different designs, a copying camera, with a fine lens attached, burnishers, tables, cupboards, lockers for the members, and in short everything used in finishing photographs, complete the furnishings of the studio. The dark room is placed in the rear of the atelier and has six separate sinks with partitions between, with taps for hydrant and filtered water, which can be cooled with ice in the summer. Shelves are placed on each side of the partitions for dishes, etc., and a large electric motor fan drives a powerful current of air into the room, making it cooler within than in the open air.

A dressing-room for ladies is also placed in the studio, and nothing has been omitted to make this as attractive as the galleries of the professional workers.

The meeting-room is carpeted, the windows are hung with lace curtains, a book-case contains all the best photo publications, a handsome dissolving lantern rests in a case opposite, and in the center is placed a baize-covered table surrounded with chairs.

Private exhibitions of magic lantern slides are given here for the members, and once a month invitations are issued for public exhibitions at Tulane Hall.

The guests were ably attended to by the Reception Committee, composed of Messrs. P. F. Reynes, W. R. Mandeville, M. D., Bernard T. Shields, S. L. Mitchell, Bryan Black, Reeve Lewis, L. E. Bauman, T. W. Castleman, R. H. Palfrey and A. C. Frietag.

THE PHOTOGRAPHIC SOCIETY OF JAPAN.

MEETING MARCH 24TH.

A MEETING of the above-mentioned Society was held in the rooms of the Geographical Society, Kyo-bashi, Tokio, on Monday, March

24th, at 4.30 P.M., Mr. Edmond Holmes in the chair.

After a special meeting to consider some proposed alterations of the rules, the ordinary meeting was opened, and the following gentlemen were unanimously elected members of the society: Messrs. R. W. Borthwick, H. Deakin, J. McDonald, C. Pope, T. P. Solomon, and A. C. Stern.

Mr. C. D. West showed a number of prints toned by Clark's new platinum toning process. In many cases there were, alongside of the platinum-toned prints, others from the same negatives toned with gold in the ordinary way. The platinum tones were blacker than the gold. There was some difference of opinion as to which were the pleasanter, but on the whole the verdict was in favor of the platinum. Mr. West explained that there was reason to believe the platinum-toned prints were more permanent than others. He found it inadvisable to use nitric acid in the bath, as recommended by Mr. Clark, at least with albumenized paper, as it gave very yellow high lights. He preferred citric acid, and a bath comparatively weak in the platinum salt. The following formula was given: To each ounce of water add one half grain of chloro-platinite of potassium and 4 or 5 grains of citric acid. This bath keeps well.

Mr. A. J. Hare showed a number of prints toned in a way a little different from the usual one. The modification consisted in dissolving a quantity of common salt in any ordinary toning bath. The prints then went direct from the printing frames to the toning bath and from the toning to the fixing bath, there being no intermediate washing. The following advantages were claimed for the modified process: Less over-printing is necessary; there is considerable saving of time; the tones are richer than when the paper is washed before reaching the toning bath, and there is much less tendency to run to "mealiness" in the shadows in the case of toning to a deep purple or black. The prints shown were done on the ready sensitized paper of the Japan Dry Plate Company, and the tones were pronounced exceedingly fine.

Mr. W. K. Burton showed a sample of the more recently manufactured eikonogen. He had received a dozen or two of bottles of the substance, and, in every case but one, the color of the chemical was nearly white; in the case of one single bottle, however, the eikonogen had turned quite black, although this particular bottle appeared to be as securely luted as the others. Mr. Burton had found

this new eikonogen distinctly superior to the old, and considered that it had clear advantages over pyro for some kinds of photograph work.

A demonstration of "photo-zincography" was then given by Messrs. W. K. Burton and I. Isawa. This is a process whereby blocks ready to be put up alongside of type can be photographically produced from any line drawing or sketch. The following is a very brief description of the various steps of the process, when, for example, it is wished to get a block from a photograph. A very light print is taken from the negative on common photographic paper, but is neither toned nor fixed. The outline is gone over with a pin and the best quality of Chinese ink and as much line shading is put in as may seem desirable, after which the print is put in a bath of a solution of bichloride of mercury. This quickly makes the photograph entirely disappear, the line sketch only remaining. If a photograph is not to be used the artist sketches directly with black ink on pure white paper. In either case the result is the same, a line sketch that is copied in the camera, the wet process being used by preference. The negative must be reversed, and the reversal is secured either by using a reversing mirror in copying or by stripping the film of the negative from the glass and turning it over. A polished zinc plate is next coated with a mixture of albumen, water, and bichromate of either ammonium or potassium, and when dry is exposed under the negative, a faintly visible image resulting. The plate is then covered with a very thin uniform coating of a greasy ink applied by a roller, and is dipped in water. In a minute or two the ink begins to leave all the plate but those parts representing the lines, and the action being helped by rubbing gently with a piece of cotton wool, there is soon an image in printers' ink on the zinc plate. The plate is dried and a quantity of powdered resin is dusted over it; this sticks to the greasy lines, but not to the rest of the surface, and a slight heating is enough to incorporate it with the ink. There is now a sufficient "resist" to make it possible to etch away some of the metal between the lines, and the plate accordingly goes into a bath of weak nitric acid. There is only one reason why the etching should not be continued until the whole of the necessary relief is got at one operation, and that is that the acid has a tendency to "under-cut" the lines. It is, therefore, necessary to protect the edges as well as the tops of the lines. To effect this protection the plate is

taken from the bath after a very little relief has been got, is dried, and is heated just to that point at which powdered resin will stick to the lines, but not to the rest of the plate. The plate is then again powdered with resin, and when the lines have taken all that they will, is heated enough to melt the resin and make it run down the sides of the lines. The plate then stands an etching in a somewhat stronger bath, and the process is repeated five to ten times, according to the coarseness or fineness of the work.

The lines thus got are firm and solid, but there are generally slight ridges running along the sides of them produced by the different etchings. To get rid of these the plate is cleansed of all resin, and is inked up with a smooth roller which touches only the tops of the lines. The operation of dusting with resin and heating is once more gone through, and the plate has its last etching—or last but one, for it is sometimes advisable to repeat this etching twice—when it is ready to be trimmed and mounted type-high for the printer.

Samples of every stage of the process from the original negative to a block that had been printed in a machine, and prints from them were shown, and the process of developing the image on the zinc and of etching was demonstrated.

The demonstrators explained that it was claimed that the whole process, from the taking of a photograph to the production of a finished block, could be gone through in two hours in England. They doubted this, but could easily do the work in from six to eight hours. The block really could be produced in two hours from the time of taking the exposed zinc plate from the printing frame. They farther explained that the advantage of the process was that an exact copy of any line subject, no matter how complicated, could be made in a few hours, either of the same size as the original, or smaller, or larger.

The proceedings ended with a vote of thanks to the demonstrators and to the Chairman.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

MEETING held in the rooms, at 113 West 38th street, May 6, 1890, at 8 o'clock, *President* HENRY J. NEWTON in the chair.

The Secretary read a list of the various publications presented to the section since the

last meeting and the usual vote of thanks was unanimously accorded.

The President, after a few remarks with regard to the new rooms, called upon Dr. M. Josiah Roberts, and that gentleman exhibited and explained his electrical shutter. This was a square framework supporting an electro-magnet, the keeper or armature of which moves by a pin and slot freely up and down. This keeper operates two wings, and when raised opens the aperture for exposure, falling again by gravity. Several flash-light pictures were exhibited, produced by the simultaneous firing of the flash and opening of the shutter by electricity. The shutter had been subjected to thorough testing, seven dozen pictures of the Centennial Parade all being successful. The great advantage claimed was the simplicity of working, and the practically entire freedom from vibration which always to a more or less extent accompanies the pneumatic release. In addition, the shutter requires no re-setting, being always ready for use. Dr. Roberts closed his remarks by predicting that in the near future we should be in possession of a camera in which both the changing of the plates and the working of the shutter would be accomplished by the mere closing of an electric circuit, by means of a Morse key. The next item on the programme was an exhibition of lantern slides, but before proceeding with this the Secretary announced his omission from the list of donations, "The Lighting of Photographic Studios," by P. C. Duchochois. This book, he said, he had carefully read, and he was convinced that it was the work of a man who was thoroughly conversant with his subject. He could heartily recommend it to all.

A most interesting series of lantern slides of "Scenes of the Last War" was then thrown on the screen, the description being given by the Secretary, Mr. Mason. The slight imperfections in these, he explained, were due to the formation of a slight deposit, either chemical or vegetable, on the glass. Examination with a hand-glass showed minute nuclei with slight radiations, while fern-like growths were noticeable proceeding inwards from the binding strips. Views of Morris Island, Hilton Head Island, Forts Wagner, McAlister, Putnam, Seymour and Sumpter, of Atlanta, Savannah, Bonaventure Cemetery and of Florida, were thoroughly appreciated by a most interested audience. There being an excursion on the following day to Williamsbridge, Mr. Henry J. Newton exhibited a fine series of "Views on the Bronx," and by request

gave a short description of his method of exposure and development.

The President was requested to nominate a committee of three to superintend the arrangements for the annual excursion.

It was announced that Professor Elmendorf would lecture on "A Tramp through the Alps," on May 22d, before the Polytechnic Section of the Institute, and a general invitation was extended to all present.

The section adjourned at the usual hour.

THE CHICAGO CAMERA CLUB.

THE last few meetings of this Club have been mainly in the way of exhibitions.

On March 6th the Boston Camera Club's "Illustrated Boston" was shown to an appreciative audience. The set is too well known for further mention. On March 28th "Glimpses of California" was shown to an audience which crowded the rooms. This effort of the Pacific Coast Amateur Photographic Association is one of the best series of lantern slides which has been set in circulation. The workmanship is excellent and the lecture interesting.

Thursday, April 10th, was the date of the first annual meeting of the Club. The following officers were elected for the ensuing year: President, Rev. M. L. Williston; Vice-Presidents, William H. Shuey and Mrs. A. C. McClurg; Secretary, Fred K. Morrill; Treasurer, J. W. Buehler; Librarian, Miss M. E. Sibley. Additional Directors, C. D. Irwin, W. B. E. Shufeldt, Mrs. N. Gray Bartlett, George M. Glessner, Shirley V. Martin. The Treasurer's report showed the affairs of the Club to be in an exceedingly flourishing condition.

May 13th the Club listened to an interesting lecture by one of its members, Mr. James Colegrove, on the subject of "Early Italian Art," illustrated by about one hundred lantern views. It was also voted to hold a grand exhibition of amateur photographic work in Chicago the coming autumn, of which further notice will be given.

On the evening of May 2d occurred the first public exhibition of the recently completed "Illustrated Chicago" set of lantern slides, by members of the Club. The audience was a brilliant one, and the occasion was a pronounced social, artistic and financial success. This series of views—of special interest in view of the location of the World's Exposition at Chicago—will be exhibited to the various camera clubs of America and Europe the coming season, under the direction of the Boston Camera Club, in its "Interchange of

Illustrated Subjects" (William Garrison Reed, manager), to whom applications should be addressed. The following notice from the Chicago Saturday *Herald* gives a good idea of the entertainment:

"This society, composed of some 150 of our city's amateur photographers, gave their first entertainment Friday evening, May 2d. Like similar organizations throughout the country, they selected their own city for initial illustration; thus Chicago, historic, picturesque, architectural, and as the World's Fair city, was presented by means of a stereopticon to the enthusiastic admiration of some 1,500 people who crowded Central Music Hall. The representation was clearly and piquantly accompanied by an instructive lecture by the Club's president, the Rev. M. L. Williston.

"Considering the vast field offered now by our wonderful magic city with its twenty-four miles of extent along Lake Michigan, the selection from such an infinite subject for presentation in a single evening was judicious and eminently satisfactory. Starting out with reproductions of the rude drawings that pass with its impossible forms as symbolic (for they are like nothing mundane), of early Chicago, the spectator is led through the mythical days, as described by the oldest settler, up into the dawn of modern times. We recognize the Court House of 1855, the ugly but famous wigwam, rendered still more hideous in its bad drawing; the old Post Office, the Crosby Opera House, with its charming recollections of art and music, the old City Hall, to that fearful epoch marked by the sad sublimity of that memorable scene of ruins of 1871.

"Then came the Chicago of to-day. Public buildings, business blocks, hotels, streets, Lake Michigan, Pullman, Stock-Yards, Washington Park Club, railroads, shipping, the river, parks, boulevards, monuments, etc.

"Some of the scenes were very beautiful, and reflect great credit upon the artistic taste of the photographer. Two or three of the views in the parks, and of the surt and waves of the lake, were exquisite, as also the cloud effect from which so marvellously appears the World's Fair that is eventually appropriated by the beautiful female figure representing Chicago. All these contributed to the esthetical sentiment of the audience, while the purely commercial element found their pleasure in gazing with pride upon the stately evidences of their city's enterprise in the lofty 'sky scrapers,' which 'lifting to the eternal heavens' their brick and stone 'from out a wilderness' of trade thick with smoke, their fine proportions turned into angular monstrosities by the use of the extreme wide angle lens necessary in a narrow street for their photographic production."

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—J. S. asks for a book of information explaining all the troubles of a photographer, what causes them, etc., also how to mix chemicals, etc.

A.—As our friend is evidently a beginner we would refer him to T. C. Roche's book, "How to Make Photographs," issued by our publishers.

Q.—H. K. writes: Please let me know if there are any photographic publications treating on the Woodbury printing processes, and if the materials can be obtained in this country?

A.—A short general description of this process will be found in Captain W. de W. Abney's "Treatise on Photography," page 174, and while all the materials may not be readily obtainable, we would advise correspondence with our publishers regarding them.

Q.—C. H. S. writes: Will you kindly, through the columns of the BULLETIN, enlighten me on the following points: 1st, What is a positive lens? I find the term used on page 368 of the *British Journal Almanac* for this year. 2d, What is the American unit in fluid measure? The English unit is, I believe, the gallon or volume of 10 pounds water at 62 degrees Fahr. Is there any reason for the selection of this particular temperature? 3d, Is there any difference between the English and American units of avoirdupois? 4th, I have been trying to sensitize albumen paper with blue-print solution, but find that it immediately dissolves the albumen, and I cannot get an even coating. How can I avoid this? Replies will greatly oblige.

A.—A positive lens is one which gives converging lines and will form an image. A double convex or plano-convex lens is positive. The American gallon is the unit of measure in this country, and consists of 231 cubic inches or 58,318 grains; 62 degrees Fahr. is normal temperature, and is arbitrary. The English and American units of avoirdupois are the same. The matter of sensitizing albumen paper with blue print solution, as cited above, opens a question which is new in our experience. Perhaps some of our readers can help him out.

Q.—T. O. complains of trouble with his silver bath turning yellow, notwithstanding that he makes it of rain water, and asks what he shall do if it becomes too alkaline. His toning bath is also out of order, working very slowly and turning the prints to a red color.

A.—If the silver bath is alkaline place it in sunlight until it becomes black, then filter it and add chemically pure nitric acid till it is just acid. Wash the prints in water containing a little ammonia, say one fluid dram to a quart, before toning, and have the toning bath slightly tepid; also be careful not to have the toning bath too alkaline.

Q.—T. R. C. writes: Will you be kind enough to tell me how I should build a structure out of doors to make large groups—say about one hundred people; give full dimensions, if possible—the angle or incline of roof and height of benches? I have an old silver bath which I boiled down in a porcelain evaporating dish; the dish in some way or other had had a piece of dry resin lying in it, how long I do not know. I ordered it washed well, and, from its appearance, thought it clean, but when I poured the bath out it had a yellow tint, and I couldn't get rid of it. The bath was perfectly clean before pouring in the dish. How can I restore it to its original color?

A.—Such a structure should be arranged in a curved line, with the ends nearer the line of the camera than the center, say 3 feet in a width of 50 feet. It will be better not to have any roof or covering over it, owing to the obstruction it would offer to the light. Each row of benches should be about 18 inches higher than the one next in front of it. To restore the bath to its original color, add to it a quantity of kaolin or pipe clay, say one teaspoonful to a quart, shake well and then thoroughly filter.

Views Caught with the Drop Shutter.

MESSRS. BUCHANAN, BROMLEY & Co. have removed from their old premises, and are now located at 1226 Arch street, Philadelphia.

THE firm of Fox & Co., comprising Messrs. T. S. Fox, J. P. Bender and G. Pierson, have located and are now operating a photo-chemical engraving plant at 932 C street. This will fill a want that has been long felt, as all engraving work for this State has heretofore found its way to the larger cities in the east and on the western coast. Mr. Fox is for-

merly of New York City, a student of the National Academy of Design, and has been identified with the engraving business in the east, while Frank Leslie's publications recently numbered Mr. Bender among those of its mechanical department.—*Tacoma Ledger, Wash.*

HOLCOMBE & METZEN, of Detroit, Mich., are fitting up, at a cost of \$3,000, a new studio at 146 and 148 Woodward avenue, in that city, which will be equal to any in the State. It will be finished in quartered oak, and have hardwood floors. The reception room is 19 x 16 feet, the operating room 19 x 38 feet, with a north skylight of ground glass in a metallic frame. A finishing room under the roof will be 14 x 22 feet. The decorations will be particularly handsome, and as fine as any studio in the west. We wish these gentlemen every success in their new and enterprising venture.

M. L. JONES, of Fort Wayne, Ind., has moved to the second floor of the building at 44 Calhoun street, in order to obtain increased facilities for his constantly enlarging business in photographic supplies. All his friends should make 44 Calhoun street their headquarters while in Fort Wayne.

EAST SAGINAW, MICH.,
MAY 14, 1890.

SOME of the Michigan photographers must have prospered in their business. Mr. WHITE, in Port Huron, is just moving into a new studio. He has built a fine two-story brick building on a corner lot, extended an L one story for operating, chemical-finishing rooms, etc.; reception-room, with large show window,

in the main building, making the gallery complete for carrying on a first-class business, all on the ground floor. It is all finished in hard wood, and is considered one of the finest galleries in the State, and one of the best things about it is that Mr. White moves into his new building without going one dollar in debt.

The most complete and the most beautiful and tastily finished gallery is just being completed by HARMAN & VERNER at Bay City. They have built a three-story brick building on the corner of 4th street and Washington avenue. Main building 25 x 70, with a large L and one-story extending along 4th street. The main or ground floor is to be devoted to reception and business room. It has a large show window on Washington avenue, also one 15 feet wide on 4th street. This comes about midway of the room. Opposite this there is a finely carved mantel, with a grate. In the rear of this room, in the L, are the ladies' and gentlemen's dressing rooms, operating room, with Hase's patent skylight; also a room for changing plates, a finishing room, a printing and negative room. The second story is the art room, 25 x 70. Third story, stock room. The whole building is finished in oak; floors all hardwood; walls, plastic finish; ceilings frescoed in the most delicate and artistic manner. The building is to be heated by steam. The basement is to be divided up into boiler room, fuel room, developing room with slate sinks, wash rooms with soapstone sinks, and a bromide room, in which they intend to work a Cooper lantern. The building cost \$11,000, exclusive of lot, and is all to be devoted to the photograph business. How is that for a saw-mill town? The Government starts in a few days to erect a building on the opposite corner, to cost \$200,000. A. H.

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ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

JUNE 14, 1890.

Vol. XXI.—No. 11.

NONACTINIC FALLACIES.

THE photographic literature of to-day, while not infallible, is remarkably free from inaccuracies, either in the announcement of new ideas, or in the development of old ones. But occasionally something apparently novel is proposed, and in the eagerness to announce the new idea some inconsistencies are promulgated. Not long ago we picked up a photographic journal, where the announcement was made that by painting the glass windows of the dark room with a solution of quinine or by placing in front of the window paper coated with the same organic solution, photographic negatives could be developed in white light. In connection with this idea we remembered a lecture experiment we had often seen performed which apparently confirmed the nonactinic property of this quinine light-filter. If a piece of ordinary white paper is taken and some design is painted upon it with a solution of quinine thickened with a little gum arabic, when the paper dries, the design will be practically invisible, the paper remaining uniformly white on the surface. Placing this sheet of paper in front of a wet plate camera and carefully focusing, a picture can be made on a wet plate, if the quinine-painted surface is illuminated with the light from burning magnesium. The picture on the paper, made in quinine, acts very nearly as nonactinic as if the design was in black pigment. A clear colorless solution of quinine in a bottle will photograph nearly as black as a similar bottle filled with black ink.

Remembering the above-mentioned facts, we at first thought that their application to dark room lighting was obvious. This was still further confirmed by the fact that glass coated with quinine prevents, or rather, greatly retards the production of prints on ordinary sensitized albumen paper. But it must not be forgotten that the wet plate process is very slow compared with the gelatino-bromide dry plate, and that albumen printing paper is also correspondingly slower. That quinine sulphate is nonactinic when used with the wet plate is owing to the insensitiveness of that plate to almost all but the violet rays, and the same is true of albumen printing paper. Now, we do not mean to say that only the violet rays of sunlight will act upon the wet plate or albumen paper, but all rays from the light blue to the red end of the spectrum are very slow in impressing the plate or the paper.

Modern dry plate photography is based upon materials that are very sensitive to those rays of the spectrum that are inactive in the wet plate process and upon

albumen printing paper. Consequently, because quinine will serve as a light-filter in the wet plate process and for albumen printing paper, it is not at all certain that it will be equally effective with modern dry plates. In order to ascertain if the proposed organic substance could be used with safety for the protection of the gelatino-bromide dry plate, we submitted a solution of quinine sulphate to an examination before the spectroscope. There was then revealed to us the fallacy of the proposal to use it as a light-filter. Placed in front of the spectroscope the quinine solution simply cuts out those rays that are violet and indigo, leaving the blue, green, yellow, orange and red ones as brilliant as before. A source of illumination composed of the latter of these rays is totally unfit for use in the dark room, and the extremely convenient non-actinic white light as a source of illumination in our dark rooms remained an unsolved puzzle.

Quite recently we came across another proposition to obtain non-actinic white light. It has long been known to chemists that a solution of cobalt, which is red, when mixed with a solution of nickel, which is green, and in the right proportions, will give a colorless fluid, the two colors being complementary. After stating the above fact the author of this new method says: "Therefore, light passing through the colorless mixture has no effect upon silver salts, and being perfectly non-actinic does not affect the sensitive film."

This assertion is a very comprehensive one, and is still further backed up by the statement that silvered paper left for a week exposed to light behind the cobalt-nickel mixture, did not show any change. A note is added to the effect that the action upon gelatino-bromide dry plates has not been tried. Here is the great mistake in this last device for obtaining nonactinic white light.

In order to note the quality of the light passing through a solution of cobalt we placed it in front of our spectroscope. The colors that were observed by the solution consisted of part of the green, yellow, and the lighter shades of blue. Placing a solution of nickel in front of the spectroscope in the same manner, we noted that the extreme violet and also the extreme red were absorbed. We now made a mixture of three parts of nickel and one part of cobalt (the proportions given to make a colorless solution), and submitted the mixture (almost colorless) to the spectroscope in the same manner as the single solutions. In this case we noted that the extreme violet and the extreme red rays were absorbed, while the yellow rays take a greenish tinge; the balance of the spectrum, including indigo, blue, green and orange, being toned down so that the colors appeared weaker.

Since the transmitted light contains indigo, blue and green, colors to which all modern dry plates are readily sensitive, the cobalt-nickel mixture is useless as a light-filter for the illumination of our dark rooms.

We used sunlight in all the above experiments; and we see no reason to believe that in the use of artificial light the results would be materially different. Indeed if gas or oil illumination was used with the cobalt-nickel mixture, the amount of light transmitted would be so small that it would be useless in the dark-room, in addition to the fact that it is not nonactinic.

It is therefore evident that a white light suitable for dark-room illumination is still *sub judice*.

All communications for the columns of the BULLETIN should reach us on Monday preceding the day of issue, to insure their publication at that time.

EDITORIAL NOTES.

WE note with interest that the enormous crown glass lens disk, intended for the University of Southern California, has been successfully cast, and is now on its way to Messrs. Alvan Clark Bros., of Cambridge, for the final process of grinding. It will be, when finished, the largest lens in the world, measuring 40 inches in diameter, or 4 inches larger than the world-renowned Lick telescope. The tube in which this crown glass lens and its flint glass companion will be mounted will measure 60 feet in length. The makers of this lens, Messrs. Mantois, of Paris, are to be congratulated on the successful issue of their work. It must be borne in mind that the casting of such a lens, however, is only a beginning of the end, and that the crucial test of workmanship is left to the process of polishing, of which in this case we have no doubt of the result, since the Messrs. Clark Bros. have been selected to do it.

LET us remind our readers that the Daguerre monument project is still under way and in want of all the substantial encouragement possible. We would urge all who feel inclined to help the monument on to completion to send their contributions to the treasurer of the New York committee, Mr. H. Littlejohn, 423 Broome street, New York. We understand that the models are all out of Mr. Hartley's hands and in the bronze foundry, and that the granite work for the pedestal is well started.

A RATHER singular and, on the whole, an interesting development has lately come to light in England by the trial of an action against one of the best London photographers for breach of contract in furnishing photographic prints which soon commenced to deteriorate by showing numerous streaks and discolorations; the premise being that these streaks were due to the presence of hyposulphite in the mounts themselves. But on careful examination and the testimony of the assistant who mounted the prints in question, it was established beyond a doubt that the trouble came from the application of saliva to the face of the print after mounting, it having been the habit of the assistant to *lick the prints with her tongue*. While this fact was established, the jury failed to come to an agreement.

WE have before us a beautiful and tastily arranged catalogue of the Sixth Annual Exhibition of the Providence Camera Club. It is very complete as a catalogue and includes, among the more prominent of its exhibitors, the names of L. L. Anderström, Charles A. Stoddard, Rev. W. H. Burbank, of Brunswick, Me., a special contributor, R. Clinton Fuller, and also the name of one lady member, Miss Sarah J. Eddy. The book is embellished with two illustrations of high quality, one of them a photogravure by the Barentzen Photogravure Company, and the other a half tone plate made by the Levytype Company of Philadelphia.

LOVERS of the platinotype process will be dismayed to learn that the cost of metallic platinum has nearly doubled within the past few weeks and is likely to go still higher—it is now quoted as high as sixty cents per gram or 15 grains, and is thus rapidly reaching the same cost base as gold. Therefore look out for your platinum waste carefully.

WE would acknowledge with thanks receipt of tickets to the first competitive exhibition of the Lynn Camera Club, and hope to be favored with a report of the same at a later date.

WE note with pleasure that Mr. John Carbutt and family have sailed for a much-needed and well-earned rest in Europe, they having gone by the *Etruria*. We wish them God speed and a safe return, and know that if their enjoyment is commensurate with the hard work which has preceded the rest, they will have a delightful trip. Mr. Carbutt's labors in the field of dry plates all are conversant with; his son has lately graduated from college and just returned from his African astronomical labors, and Miss Carbutt has just graduated from Vassar College.

WE learn from our exchanges that a new flash powder has been worked out by Dr. James Taylor, of the United States Department of Agriculture, which is obtained from the down of the milk weed converted into charcoal, and which is said to be almost entirely free from ash and to burn with a remarkable freedom and rapidity, and it is expected that this new substance may largely supercede many of the dangerous flash compounds now in use.

REPLYING to a recent letter from the Society of Amateur Photographers of New York asking for free entry of photographic lenses which the Society proposed to import with a view to raising the standard of home manufacture, Assistant Secretary Tichenor, of the Treasury Department, rules "that as the Society is not established for philosophical, educational or scientific purposes," the lenses do not come within the meaning of the law and may not be allowed free entry.

WE regret to record the death, at the age of fifty-eight years, of Colonel Stuart Wortley, one who for many years occupied a foremost place among the London photographers. His most noted works were in the way of large landscapes and seascapes, in many of which his methods of lighting were strikingly effective.

THE question has lately been raised, in Durham, England, as to the right of an advertiser to use the stereopticon for the purpose of advertising his wares, when by so doing the effect is to gather a crowd and block the thoroughfare. In the case in point the defendants were found guilty of maintaining a nuisance, and were bound over for judgment.

WE have read, with much interest, the photographic romance by Mrs. Elizabeth W. Champney, which appeared in the May *Century Magazine*, and which was entitled: "The Romance of Two Cameras." Mrs. Champney certainly has worked out, very ingeniously, and with much interest, a scheme which we have not seen touched upon before, and her handling of the story shows an intimate and loving acquaintance with photography, which we may well believe has been acquired during her matrimonial partnership, as the wife of Mr. J. Wells Champney, the well known artist and amateur photographer.

"THE International Annual" is now in the hands of the binder, and with its wealth of contributions from one hundred and eighty-six authors and twenty-two illustrations is certainly a volume both useful and ornamental for the library of every progressive photographer, either professional or amateur. We hope to give a more extended notice of it in a future issue of the BULLETIN.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Photography in Natural Colors again.—Red Glass for Dark Rooms.—Ready mixed Developers.—How much Gold and Silver is used in the Printing Process.—Recovering Gold from the Sulphocyanide Gold Bath.

VERESZ' photographs in natural colors are still the daily talk. In regard to their durability I have given already my opinion. But one question seems to me still more important, that is, the resemblance of the colors to nature. Having been previously without the originals, I was not enabled to give a decision.

In the meantime I have obtained from the inventor Veresz a new photographic picture with the original, and I am now in the position to give a positive criticism about the natural resemblance of the colors. This refers only to the picture on paper which at present is before me.

The original is one of those transparent window-pictures in bright colors, brought into market by Grimme and Hempel, in Leipsic, as a substitute for glass-painting. It represents a Cupid with yellowish brown hair and wings, and a small blue scarf around the waist, whose ends wave in the wind. He carries an arrow piercing two hearts of ruby color; between the knees he holds a quiver with yellow ornamented opening, and in his left hand the upper part of a large brown cross-bow, with blue and yellow mountings, the lower part of which rests, with the figure, upon an idealistic thistle blossom of red leaves. The stem is of the same color and the plant shows fresh green leaves. The picture has a pale-blue background, and red, green and yellow ornamentation around the border in very pronounced colors.

This border ornamentation affords an excellent means of comparison with the print. The latter, in opposition to the bright original, shows a greenish-gray, partly dark ground. At first look one recognizes readily that of all the colors only the red of the original has been distinctly reproduced. But it is not true to nature; it has a copper-red color, and differs decidedly from the vermilion and carmine red of the original. Besides this copper-red only the blue of the scarf and the mountings of the cross-bow and quiver comes out as a very pale light blue, with no natural resemblance; the black lines of the border decoration appear alongside of this as a violet black.

These are the tones which to some extent have a similarity of color, but with the other colors it is not so favorable.

The yellow squares and green trapezoids of the border decoration appear neither yellow nor green, but have a grayish-red tone; the blue fields are not blue, but greenish-gray like the ground.

It is most singular that several parts are reproduced in red, which actually are not red but brown-yellow, as for instance the hair, the wings, the cross-bow, the thistle, etc. The green leaves in the print show no fresh color, and the red leaves of the blossom and the body of the Cupid show only a pale flesh color.

It is also remarkable that the thin lines of the shadows (black in the original) appear red in the print, even in those parts not colored red; while the broad black lines, as remarked above, are black.

The resemblance of the new photographic pictures to natural colors is therefore not very favorable. Only two colors can be recognized distinctly in the copy, of which the red is the best, in a less degree the blue, which is weaker as far as the picture is concerned. The blue in the ornamentation around the border and all other colors either have not been reproduced at all or are entirely unlike the original. It is possible that these discrepancies did not appear so prominently in the previously described glass pictures, whose colors were decidedly more lively. I have no proper object at present to make a comparison to decide this question.

If I compare the sample before me with the pictures I have seen in 1867 of Niepce de St. Victor, Becquerel, and Dr. Zenker, I must confess that those much older productions were richer in color, although the tones deviated likewise considerably from the natural ones. An essential progress I can therefore not recognize in the present pictures. But after all it is good to revive the problem and thus animate to further experiments.

If other scientists, like Dr. Eder, Eugen von Gothard, etc., express themselves more favorable about Veresz' photographic pictures, the reason may be that they have not seen the older productions, which I have.

Recently repeated complaints have been made about the colored glass for dark-room lamps and windows, which are not without reason.

Every dark room glass should keep back that light which acts strongest upon the plate. This is particularly the blue light for ordinary plates and the green and green-yellow for color-sensitive plates. This is avoided most completely by a suitable glass of red, copper-flashed.

It must not be too thin, of course. We have seen red glass lately which was so thin that a considerable part of green light could pass through.

By looking through the spectroscope this defect could at once be detected, and I have made the remark already some time ago, that all glasses, which we use for the dark room window, should be tested spectroscopically.

This can be done easily by anybody.

It has been proven that lights cut from the same sheet are not always alike. Some of them are correct, others are too thin again. To overcome this defect once and for all and to furnish all buyers the certainty that they get good glasses behind which the plates will not fog, the dealers should sell only glass which has been tested.

Even if it is a little more expensive, the loss caused by bad and fogged plates is much higher.

At the Royal Technical High School we apply a pocket spectroscope, which can be had at the moderate price of 36 m. from Schmidt & Hoensch, opticians, in Berlin. This is focused by drawing it out until the celebrated Fraunhofer lines can be recognized distinctly. Placing the red glass to be tested in front of the same it should admit only red light; all other light should be absorbed. The only correct glass is copper oxide flashed glass. The red gold glass, which resembles the other very much, is not suitable—it admits a considerable quantity of blue light.

Now, if the glasses of a weak red or gold red are a bad thing, the glass com-

binations of green and yellow should be discarded entirely. Besides the green they will admit even greenish blue, and cannot be used even for ordinary plates. The combination of green and yellow is just as objectionable, as they will darken the laboratory in an extraordinary manner.

With an actually good red glass, ordinary and even color sensitive eosin silver plates can be developed.

Only for red sensitive azalin plates it should be recommended to subdue the light somewhat in the beginning of development and to keep the plate as much as possible in the shadow.

For several years ready mixed developer, which is also sold by the dealers, has been in general use. This has also been done at the Royal High School. Lately it has been demonstrated that old developer, even if not used previously, will easily give silver glossy fogs, and this is particularly the case with the hydroquinone developer. This fog is also obtained, if by accident some fixing soda should come into the developer. It can be wiped off with the fingers, but it is always disturbing. Eikonogen developer is always kept in separated solutions, as is well known. We do the same with the hydroquinone developer—that is, we keep the alkali (carbonate of soda) and the hydroquinone by themselves and mix them shortly before use. After use we keep the developer three to four days and prefer to apply it for over-exposed plates.

About the consumption of gold and silver in the positive process we had lately an interesting discussion in the Verein zur Förderung der Photographie.

The chairman reports, according to tests made by him and the experiments published in his text book, that if the silver bath has been freshly made 2.6 grams will be used per sheet, but that by a continued strengthening of the bath the consumption will decrease to 2 grams. This of course, was at a time when the paper was strongly salted; at present, when the quantity of the salt amounts to only 1 per cent., 1.2 grams of silver is consumed per sheet.

Mr. Haberlandt reports that in former years he used less silver, but that at present, in consequence of the many complaints made, the paper is again more salted, in consequence of which the consumption of silver per sheet would come to 2 grams. Mr. Bouck uses on an average 1.25 grams per sheet.

Mr. Haberlandt remarks that thinner baths, weakened by use, will make the paper fibrous. Mr. Vogel, Jr., brings this back to the circumstances, that the albumen is not sufficiently coagulated by a want of nitrate of silver.

About the consumption of gold the chairman reports that 3 c.c. gold solution 1:50 are used per sheet at the High School.

Mr. Haberlandt dissolves 5 grams chloride of gold in 700 of water, and uses 4 to 5 c.c. of this solution per sheet.

Mr. Bouck used 20 grams chloride of gold per ream, therefore, per sheet about $\frac{1}{25}$ gm., that is two-thirds as much as at the High School.

Another subject of discussion was the precipitation of gold from old sulphocyanide gold baths. Sulphate of iron is not suitable.

The magnesium powder proposed by Mr. Haberlandt for this purpose would not work, but oxalate developer precipitated the gold to a great extent by heating.

BERLIN, May, 1890.

WHILE so many sound its praises it is only necessary for me to say that it (the BULLETIN) is exceedingly valuable to me.

G. N. MOORE,
Washington Terr.

PHOTOGRAPHY IN NATURAL COLORS.

BY J. GAEDICKE.

OUR present time is so much imbued with sensational novelties, that it leaves hardly any time to the normal development of science, and it gathers already, precipitately, the discoveries of future days. So it is with the photographic reproduction of natural colors. A notice passed through the journals, according to which the problem of color-photography had been solved, and that the honors of this invention belonged to a photographer in Klausenburg, Mr. Veresz. But a close examination reveals the fact that said photographer has done nothing more or less than what was already published by Niepce de St. Victor, in 1852, and Poitevin and Simpson in 1866. He cannot show the least progress, as his preparations are much less sensitive and the pictures are much less durable than those of his predecessors.

The practical significance of the matter and the progress may be sufficiently estimated, considering the necessity of exposures of "several weeks" and a duration which had not been shaken "after lying in a lighted room" for several hours. In the face of these exaggerations of the Klausenburg accomplishments to the solution of the problem of color photography, and the fact that by such manœuvres the public is only led astray, it seems, in order to recapitulate in a few words, what has already been accomplished upon the above mentioned field.

The first observations about the existence of a colored spectrum upon chloride of silver were published by Dr. Seebeck, in 1810. Sir John Herschel made also mention of colors upon chloride of silver, in 1839.

Becquerel was the first who obtained a spectrum with all colors. After having been occupied with this matter since 1838, he presented, in 1848, his first report to the Paris Academy of Sciences. He employed highly polished silver plates, which, fastened to the positive pole of a battery, he immersed in diluted muriatic acid (1 : 8) and passed a platinum wire, connected with the negative pole, from both ends. The silver plate became tarnished by absorbing chloride and took up gradually a number of colors. By prolonged action there was a repetition of the colors these representing the number of the second degree. He continued this until he obtained a color number of the fourth degree, whereupon, later on, according to experience, the most brilliant colors developed. Becquerel determined also the quantity of the chlorine, which was taken from the plate, by inserting a voltmeter, and measuring the hydrogen gas developed in the same, which gave the quantity of the developed chlorine. He determined that the best results are obtained if about 6.5 c.c. hydrogen per square decimeter of the plate are developed. Becquerel found further that, if the chlorinized plate was exposed for a longer period to a temperature of 30 to 35 degrees C., it would give much lighter colors, and that the action of the temperature can be restored by exposing the plates under a combination of ruby and cobalt glass for one to two hours to sunlight. The film becomes hereby dark violet, and is bleached in the camera by white light and is colored correspondingly by colored light. The colors appear here light upon dark ground. In the camera one has to expose for several hours with a very bright light, and the pictures so produced are said to be visible in the dark, while they disappear gradually in light.

Herschel reports, in 1855, that a colored spectrum picture which he obtained from Becquerel, but which he kept in the dark and examined only by lamp-light, was not decomposed after several years, although it had bleached a little.

The next progress in color photography was made by Niepce de St. Victor, who presented his investigations about this subject in 1851 and 1852 to the Paris Academy of Sciences. Niepce used also silver plates as a basis, but simplified the chlorination by using baths containing chlorides in place of the galvanic battery, and found that additions of certain flame-coloring salts increase the capacity of reproduction of the corresponding colors and the sensitiveness. As a best chlorinizing means he finds a mixture of chloride of magnesium and sulphate of copper. Afterwards the plate is heated until it shows a bright red color.

In this way he obtained camera pictures in fifteen to thirteen seconds in the sun or sixty seconds in diffused light with rapid objectives. The durability was also increased by Niepce by applying for fixing a solution of chloride of lead with a subsequent coating of tincture of benzine. At the Paris Exhibition of 1867 there were heliochromic pictures, produced by Niepce, which, according to the records of the French Photographic Society, had kept well preserved during the seven months' exhibition, and which suffered only a little in the brilliancy of the colors. The pictures were exhibited in a case, which was opened for inspection, and then closed again.

According to Niepce, the spectrum colors will appear present, while the pigment colors do not appear always in the same shade. Emerald, for instance, or arsenic copper shows green, but a green mixture of chrome yellow with ruby blue will come as blue. Orange, produced by yellow and red glasses placed together, will reproduce as red.

In 1866 Poitevin appeared with a new heliochromic work, whereby he used paper as a support. He floats plain paper on a chloride of sodium solution, and after drying on the silver bath, washes with water in a dish, and pours into the last water a solution of chloride of tin, exposes the dish to light, and lets the paper become dark violet in from five to ten minutes. He washes now with water and dries in the dark. The paper is now made sensitive by immersing the same in a bath consisting of an equal volume of a 5 per cent. solution of bichromate of potassium and a concentrated solution of sulphate of copper, after which it is dried.

Under a colored diapositive this paper will give, exposed for half an hour to the sun, or for one and a half days to diffused light, a clear colored picture upon dark ground.

Poitevin obtained also colored pictures with collodion. Simpson produced in 1866 colored-light impressions upon chloride of silver collodion by printing under aniline colors and colored glasses.

Saint Florent communicated to the French Society of Photography, in 1882, his process to produce colors photographically upon paper.

During the latter years a more extended research was published by Carey Lea, in which he designates compounds of chloride of silver with very little chloride of silver as photo salts, and proves that with different quantities of chloride compounds different colors will originate.

The final result is, that twenty years ago we were more advanced regarding

the sensitiveness and durability of the products than Mr. Verres is at the present day, and that there is no reason yet to consider the problem of photography in natural colors as practically solved.

[From Photographische Nachrichten.]

AN EASY PRACTICAL METHOD OF FINDING THE FOCUS OF AN OBJECTIVE.

BY F. STOLZE.

THE practical photographer is naturally no friend of complicated calculations; he prefers a purely practical method of ascertaining the focal length of his objective. Unfortunately, these purely practical methods are not always so simple, and this is particularly the case with the well-known rule of focusing the camera first for a distant object, and then focusing a measure in such a way that the image appears exactly of its natural size on the focusing screen, when the difference of the two positions gives the focal length. Theoretically, this is as correct as it is simple. Any one, however, who has attempted to focus an object exactly its natural size knows what kind of job it is. If it appear too small on the screen one must go nearer with the camera, and then focus again. The image is now, however, just as likely to be too large as it was too small before. The process must then be repeated, and one may congratulate one's self on extraordinary good fortune if one succeed in obtaining a satisfactory result after half an hour's trouble and annoyance. Really accurate it will not be even then. Belitzky's method consists of comparing the objective whose focal length it is desired to measure with another, by focusing both for the same distant object, in which case the two focal lengths bear the same relationship to one another as do the two resulting images. But for this is required an objective the focal length of which is accurately known. Few professional photographers, however, know exactly the length of any of their objectives, and amateurs are usually masters of one, and desire a means of ascertaining the focal length of this one. I will therefore proceed to give a method by which the exact focal length can be ascertained without fail, and which involves only two focusings and a single multiplication.

The camera is first focused for infinity, *i. e.*, on a very distant object, and the position marked on the slide. It is then pointed at a near rectangular object of easily measurable dimensions—preferably a measure—in such a way that the image falls on the middle of the screen, accurately focused, and the position again marked on the slide. In this position the object—the measure—is photographed, and this photograph enables the operator to estimate how much smaller are the dimensions of the image than those of the object itself. Multiplying the distance between the positions of the two different focusings by this factor will then give the focal length. A few examples, in which a meter rod is supposed to be the object photographed, will make the matter clear.

Example 1.—100 mm. of the meter rod measure on the photograph 73 mm., and the distance between the two focusings is 19 cm. The focal length will be :

$$f = 19 \times \frac{100}{73} \text{ cm.} = 26.03 \text{ cm.}$$

Example 2.—100 mm. of the meter-rod measure on the photograph 21 mm. and the distance between the two focusings is 5.5 cm. The focal length will be :

$$f = 5.5 \times \frac{100}{21} \text{ cm.} = 26.14 \text{ cm.}$$

Example 3.—100 mm. of the meter-rod measure on the photograph 10.2 mm., and the distance between the two focusings is 2.7 cm. The focal length will be :

$$f = 2.7 \times \frac{100}{10.2} \text{ cm.} = 26.47 \text{ cm.}$$

In all three cases the real focal length was actually 26 cm. As will be observed, the accuracy attained in the second case is quite sufficient—the error not amounting to more than $\frac{1}{260}$; in the third case the difference amounts to $\frac{1}{52}$; while the first instance will satisfy the most excessive demands. It follows that the measure ought to be photographed as large (*i. e.*, as near the natural size) as the camera admits; but even when the camera cannot be lengthened above a quarter of that distance practically sufficient accuracy may be reached.

NOTES ON OPTICAL LANTERNS.

Before Philadelphia Photographic Society.

THE subject announced for discussion was “Optical Lanterns and Methods of Illumination in Connection Therewith,” which was introduced by Mr. Stirling, with the following remarks :

“ I make a personal statement at the start, which is to the effect that I am going to talk on something I know very little about. The idea is simply to speak of lanterns very briefly, and tell you what we have here, and, if the members desire, to show one or two of the lanterns. Like a good many other scientific apparatus, the lantern was originally very little more than a toy. It is very ‘antique,’ and there has been but little change in the general principles of the lantern that we have now. There are various references in books dating in the middle ages, in the fifteenth, sixteenth and seventeenth centuries, to indicate that the magic lantern was used—that the principle was known. There are some remote references in ancient writings on the black art, which have been thought to refer to the magic lantern. But it is known almost positively that it dates from somewhere about the middle of the seventeenth century.

“ The light we use now is practically the Drummond light, which was invented by Lieutenant Drummond, a royal engineer, about 1826. A Philadelphia scientist had previously discovered that the mixture of hydrogen and oxygen gases in the blow-pipe produced the most intense artificial heat hitherto known. I think the temperature of an oxyhydrogen flame is estimated to be 4,000 degrees Fahr. The illumination that was used in early lanterns was very imperfect. The illustrations show single wick lamps, and even candles. I believe the first scientific apparatus for the burning of mineral oil was produced here in Philadelphia by Mr. Marcy. He called it the sciopicon. As far as I know, there has been very little change in that instrument, but of course it has been improved. The lamp is a two-wick burner, and the flame-chamber is part of the body of the lamp. There are innumerable styles of oil lanterns, with two wicks, and set, as in that one (pointing), edge on the condenser. There is a lantern here with two wicks set at an angle. There are two, three, four and five-wick lamps; and here is a new lamp, in which there are two concentric wicks. The relative virtues of these

different forms of oil lamps is an open question which, possibly, is a suitable one for the members to discuss themselves.

“ There are several different methods of using the oxyhydrogen light. The jet that is now generally used is what is called the mixed jet. The gases are mixed just before they are ignited, and Lieutenant Drummond found that the burning of these gases through a blow-pipe upon a surface of lime produced a light which is equivalent to 430 candle power. Other substances than lime have been sought for, but none have been so satisfactory.

“ Here is a primitive form of the mixed jet. The two gases are supplied to a little chamber by separate openings. They are mixed there and then pass up to the nozzle of the jet. A very simple form of it is the one in this lamp, which is the invention of Mr. Ives, a member of this Society, and which is a model of compactness.

“ The danger of using a mixed jet results from the fact that these two gases when mixed become highly explosive, and if for some reason or other the pressure in the cylinders happens to be unequal, a mixture of the large volumes in the cylinders is liable to occur, and a terrific explosion is the consequence, with sometimes fatal results. In order to avoid danger, what is called the safety jet was invented, the principle of which consists in the mixture of the gases at the moment of ignition. Still another form is called the oxycalcium jet, in which the flame of the spirit lamp takes the place of the hydrogen, the oxygen being blown through the flame under pressure. A practical difficulty in lantern operation is the preservation of the limes. When not in use they are apt to become air-slaked, and when in service they become disintegrated by the action of the intense heat. This disintegrating action proceeds rapidly while the jet is burning, causing a pit in the lime. This reduces the strength of the lime, besides forming a source of danger to the condenser, which is liable to be broken by deflected rays of heat. Therefore various mechanical contrivances have been used to turn and raise the lime, so that a fresh surface can be readily presented at the orifice of the jet. Some of these move by clock-work and some by hand. Specimens of both systems are upon the table.” Mr. Stirling went on to explain the principle of the Ives saturator, and other appliances intended to obviate the necessity of providing a hydrogen cylinder or source of supply.

Mr. Vaux asked if any arrangement had been made to prevent back pressure of the gases. Mr. Stirling replied that such valves were in successful use.

FOUR DIFFERENT PRINTING PROCESSES SUITABLE FOR COPYING TRACINGS.

BY J. E. GOOLD.

[A Communication to the Newcastle-on-Tyne and Northern Counties Photographic Association.]

I WILL briefly describe four different processes by which an exact copy of a drawing on tracing paper can be made. First :

Colas' Process, which gives a black line on a white ground, is now greatly in use for copying tracings ; it prints quickly, and is very simple to work. The exposure ranges from five to ten minutes in the sunlight, and from twenty to forty minutes in the shade. I find the best results are got on a bright day, and printing in the strongest light. I have very often to reduce large drawings made on yellow tracing paper to a small scale to transfer to a stone for lithographic purposes, and use this process to get a more suitable copy to photograph from.

To make a print, you put the tracing face downward in the printing frame, and place the sensitive paper on the top of it, then a piece of thick felt, and then the backs, and put a good pressure on by means of screws, which are much better than springs, as you are able to get a more even pressure. To ascertain if sufficiently printed, lift up one corner, and if the greenish-yellow tint has disappeared except where covered by the lines, it should be taken out and immersed face upward in a bath composed of gallic acid, 20 parts; alcohol (methylated), 200 parts; and water, 1,000 parts; and remain for about three minutes; at end of time the lines will be up strong and black; it should then be thoroughly washed in running water for a quarter of an hour, and surface rubbed with soft sponge; then taken out and hung up to dry. The following will be found a good formula for sensitizing the paper:

Gelatine.....	10 parts.
Perchloride of iron.....	20 "
Tartaric acid.....	10 "
Persulphate of zinc.....	10 "
Water.....	300 "

Apply this by means of either a broad, flat, camel's-hair brush or a fine sponge to a hard, well-sized paper, then hang up to dry in a dark room. To over-expose a print means losing the lines, and under-exposure gives a very dirty neutral tint ground and very faint lines.

Pellets' Process.—This is the best process I know of for copying tracings, it being much quicker than any other, and giving a brighter result, although there is more trouble in finishing the print, as it requires developing on a saturated solution of yellow prussiate of potash. The print must be allowed to remain for half a minute, then lift out of bath, and hung up by means of American clips until the lines have developed up to a strong dark blue; then immediately lay face down in a tray of water to stop the action of the developer, and by means of an India-rubber pipe splash water on the back of print. It must then be placed, and completely covered, in a bath composed of one part hydrochloric acid to ten of water for five minutes; now take out and well wash the surface, and rub with broad camel's-hair brush to remove the loose blue sediment that would otherwise remain; after again rinsing, hang up to dry, and the result will be a beautiful clean white ground with strong blue lines.

Ferro-prussiate Process gives a white line on a blue ground, but is not so suitable for copying tracings: (1) because you cannot very well alter anything on the print, and (2) a mechanical or architectural drawing cannot be tinted as in the other processes previously described, although it is a cheap and rapid method of printing from negatives of drawings giving a blue line on a white ground, the exposure only taking from five to ten minutes in a good light. The great advantage is, the prints require neither toning nor fixing; all that is needed is to wash in a plentiful supply of clean water until the lines are dark and ground perfectly white. Or if a copy from a tracing, the lines should be quite white and ground a good dark blue.



THE NAME STILL LIVES.—*Visitor*—So this is the place where the celebrated Diamond Spring Water is bottled? *Owner*—Yes. *Visitor*—And where is the great spring itself? *Owner*—Oh, the spring—that dried up long ago, but the name still lives.

[From *The British Journal of Photography*.]**THE ART OF RETOUCHING.**

BY REDMOND BARRETT.

I.—INTRODUCTORY.

FROM the number of articles written by our most eminent photographers and scientists, both professional and amateur, one would be likely to think that all the subjects in connection with photography must necessarily be exhausted; but it is not so. Photography to-day is more exhaustless than it was years ago. Constant improvement, changes in the various modes of production, enlargement in its field of operation, I feel sure will always keep photography, as an art science, in a prominent position. Of late years there was nothing which caused such a revolution in its working as did the introduction of the dry plate process, followed by the almost complete abandonment of the old wet plate one as a natural result. All these changes and developments have received, and are receiving every day, ample treatment by members of the photographic profession of the most undoubted ability.

There was one branch, however, that received but scant attention, in public, from any of the recognized professors of the art of photography, although it had remained steadily indispensable in the production of really first-class and marketable photography from the moment of its first introduction. It is this branch, the art of retouching, that will demand our complete attention. It is not now so much neglected as it was, but until I wrote a series of papers a few years ago, at the request of the editor of *The British Journal of Photography*, no one had treated the subject exhaustively for, I should think, ten to fifteen years. Since then, however, many works have appeared on the subject.

At the present moment there is not a leading or fashionable photographer who does not largely utilize the services of the artistic retoucher. It is, however, an amiable weakness of the former to forget his indebtedness, and many scarcely deign to acknowledge the necessity of employing the retoucher at all. Notwithstanding all this they do employ him, and must acknowledge that his services are a necessary factor in the production of their self-styled "art-photography." Indeed, personally, I think that the retoucher lends a certain justification to the qualification of the science of photography as an art. Suppose we were to ask, "What is there artistic about photography if it be not the retoucher's work?" The only answer that suggests itself to me is the posing and lighting of the subject under treatment. This would leave the photographic portion to be considered purely mechanical, or, if preferred, scientific, but most assuredly not artistic. In fact, absolute success in this regard—posing, lighting and the general composition of a picture—tends more to entitle the operator to call himself an artist rather than photography an art. I may here mention that in Paris many of the leading houses retain artists proper, if I may so put it, for the sole purpose of posing the sitter and arranging the draperies, to the absolute exclusion of the operator, however clever he may be, and leaving him nothing to do beyond working the camera and exposing the plate. This may be carrying matters to an extreme, and, personally, I think, it is so, and is exceedingly hard upon many operators who are undoubtedly possessed of very considerable artistic instincts.

I believe we should all work, great and small, for the exaltation of the art

by which we make a living, and not by individually running each other down. One branch should not seek to lessen the importance of another, for by doing so nothing is gained, but much may be lost. I say this advisedly, because where the retoucher is treated as of little importance he will become careless, and his work less meritorious. I have myself worked years with a photographer who looked upon retouchers as imposters—I might almost say pickpockets. He considered that we actually deprived him of what he had to pay us, that our work was altogether unimportant, and it was only the ridiculous fad of the customers that would have their photographs retouched. Of course, we knew that a good deal of this was “bosh,” but still there it was, and it had its effect.

I have often asked myself how it was that none of the photographers who so ignore the poor retoucher have ever had the courage of their oft-expressed opinions, and dared to offer to the public even their most successful work without having previously passed it through his despised hands. There may be, one of these days, some adventurous photographer who will essay this experiment, but when he does I advise him to have his “instantaneous shutter” in good working order, for he will certainly have to use it. As for his productions, I feel sure a very “short exposure” of them will suffice to establish their unsalable qualities. Notwithstanding these oft-expressed adverse opinions, and many really talented men have not hesitated to put the same in print, I beg most humbly to say, after many years of varied experience, both in this country and abroad, that the art of retouching is not only a help or accessory, but an absolute necessity in the production of the successful marketable photograph of the present day, and of the future as well. Were this not so, I fear many of my fellow-workers would be left to starve unless they turned their abilities to some more appreciated branch. There is no need, however, to lose courage; we are not to be done without. Our position at present is secure, but we must study and practice to keep it so, and be always able to show our rivals that we can not only improve their good negatives, but likewise make their bad ones at least presentable, if not absolutely successful. I fear the little family jars between the retoucher and operator are close akin to those which sometimes crop up even in the best regulated families, but they will never reach the point that means separation. I fear, like the latter, we are “necessary evils” one to the other.

In this treatise my endeavor will be not only to point out the close relationship of art retouching to art photography and the benefits derived by the latter from their combination, but also to give in simple and complete form the necessary instructions to enable the reader to acquire a complete mastery over the different methods employed. I feel sure there is a general want for such a work as the present one, so it is my intention to go more exhaustively into the matter than any one who has hitherto written on this interesting subject.

The treatment of landscape negatives I do not think has ever received sufficient attention, although so much may be done to them to increase their excellence, however good they may be. It is needless to say, the more perfect the negative the less work it will require, and, of course, *vice versa*. There are many first-rate negatives of this class which may in their natural condition be somewhat spoiled by a small defect; by the retoucher's help this may be set right, and so an otherwise really good negative saved. Great relief may be given to a negative by the introduction of a cloud; should this not be in the negative the retoucher must “raise the wind” and produce the cloud.

The reproduction of faded photographs and pictures of all descriptions, of broken negatives and positives, the copying of oil paintings and other works of art, are all cases that demand the utmost skill on the part of the retoucher to force up such details as may get lost through the impotency of photography, or defects which may be the results of natural decay in the originals, or injuries by breakage and accident. In many cases the negatives taken of some very old oil paintings are absolutely useless until the defective portions have been worked upon by the skillful retoucher. To all these facts I will draw special attention as this work progresses.

It must be clearly understood that the mere perusal of the instructions hereafter given will not prove sufficient to enable every reader to become a thorough master of the art of retouching, and thus become a competent and skillful retoucher; still, the careful carrying out of them in practice will enable any one endowed with an ordinary amount of taste and artistic feeling to, in a short time, produce very creditable results. If a year of careful study and steady practice should bring taste and artistic feeling to the student he should be very well satisfied indeed. To those who are anxious to more rapidly acquire proficiency in the art I would advise personal lessons from some sound, practical retoucher (one of long experience, who has had a fair art education), under whose direction success will be absolutely assured.

It is usual to say that a thorough art education is necessary before becoming a good retoucher. With this I do not quite agree. I believe a man can become a very good retoucher indeed, and yet not have had an extreme artistic training. Most certainly those who possess a thorough art education will find it of very great service as they go along, and decidedly their work will be superior to the work of those who have not had one, or those who have had one to a less degree; but it is not an absolute necessity. This, providing all things else are equal.

One cannot be too careful in selecting a method or style of working, as much of their future success assuredly depends upon it. Assuming that a certain method has been adopted, the utmost vigilance must be exercised lest we fall into thoughtlessness. Thoughtlessness in our work will assuredly lead to its becoming mechanical. If once we become thoughtless and mechanical in our treatment of a subject and allow this method of working to firmly lay hold upon us, farewell to our ever producing work with any pretension to artistic excellence. Above all things, think as you work. Never become the slave of routine. A head may be treated in an off hand, thoughtless and somewhat mechanical manner, and yet be very pretty and effective, but it is never life-like. It will have a wooden appearance, and be devoid of all intellectual beauty. Under these circumstances it is only to be expected that the truly artistic operator should question the legitimacy of our work, for, instead of removing the defects or adding something to the beauty of the negative, we will be simply robbing it of all the artistic merit that may have given him a world of trouble to secure.

The photographer cannot shift from himself the responsibility in many such cases. He will unhesitatingly engage a really first-rate man as operator, and accordingly give him a big salary. Possibly he will produce a very superior class of negative; we will concede that he does. But now begins the trouble—What kind of a retoucher has he engaged? If an equally good man as his operator, no doubt the result will be magnificent photography. But suppose,

as is too often the case, a cheap and inferior man occupies the position—well, all the excellence of the operator is of no avail. This fact is not in many cases attributable so much to the photographer's desire to economize in his expenses as to his failing to appreciate or care for the department represented by the retoucher.

To argue seriously as to the legitimacy of genuine and artistic retouching I think would be useless, for whatever the result, the fact would remain that we must have it. The operator must be bigoted, I might indeed say blind, who would deny the natural shortcomings of his own department. Suppose a lady with auburn locks and a plentiful supply of freckles should sit for her portrait, how does photography treat her? She might as well have had very dark hair and been badly pitted from small-pox. Could it be insisted that she should accept this as a true likeness of herself? In life, such a subject might be truly pretty, whereas the plain, unretouched photograph makes her look positively dreadful. All this the skillful retoucher may set right with a touch, not necessarily limiting his efforts to simply removing the natural blemishes of the untouched negative, but by cleverly imparting a more pleasant expression to the face can greatly enhance its beauty and value. There are many such examples of nature being badly misrepresented by photography; see, too, how the lines in the face are at times exaggerated. This is all supposing that the operator is a "first-rater;" let us see how it would be if he were not. We would have badly lighted pictures, bestowing on every sitter hollow, sunken eyes, dark blotches under the nose and chin; in a word, the poor retoucher might exclaim, like the Gilbertian policeman, "the retoucher's lot is not a happy one."

I am perfectly willing to acknowledge that there are retouchers about who would ruin any negative entrusted to their care. A great deal of the inferior retouching of recent years may be classed as the cheap and nasty, but as long as the photographers will patronize the would-be artists who produce it simply because it is cheap, they must not complain. The real cruelty is that really good men are obliged to share the opprobrium brought upon their profession by their inferior brethren. But, practically, this does not affect the art of retouching, for such men never possessed the art or any artistic feeling.

To all, therefore, who would seriously master the various methods of artistic retouching this little work will, I hope, provide the theory—the reader must provide the taste and the brains.

[From *The Photographic News*.]

GRADE IN PROFESSIONAL PHOTOGRAPHY.

BY H. COLEBROOK.

SCARCELY another business can show so many widely distinct and varied grades as photography, and a study of no mean interest may be found—to those who care about such things—in the links and connections which bind the highest to the lowest, the court photographer to the beach-man, wide as is the difference between them. It would almost seem, from the countless numbers of existing grades, that each professor of the art finds for himself an original position, so forming a grade of his own; and further, were it possible for a man to ascend, by gradual progression, through these many divisions, from the lowest degree to the highest points, it may be imagined that the extent of his improve-

ment would be patent to himself. It is only by selecting, for comparison, points fairly wide apart, that any real difference can be appreciated. The comparison of the two extremes would present something truly striking, but the gradual course through all would give little or no idea of progress in photography. There is the difference of taste, the difference of education, the difference of position, opportunity, capital, all influencing that widest difference of all between good and bad photography. For illustration take four representatives from the two extremes, and two intermediate stages.

The "beach-man," as he has already been called in this article—though merely for distinction—will perhaps be better recognized from his description than from his name. There is nothing extraordinary in his being found by the sad sea waves—there is something even appropriate in it. He has many points in common with the seafaring man: His general appearance hardy and weather-beaten, his prominent feature partaking of the beacon description, his eyes bearing that almost barometrical indication of too much "wet," the effect of shingle and sand giving him a walk peculiarly his own, all proclaim the man. His general standpoint is between two bars—viz., the harbor-bar, if there be one, and the refreshment bar, which there is sure to be. He moves among the crowd of pleasure-seekers, bearing in his hand a specimen of work—to the public, a beautiful collodion positive; to the initiated, a silver print set off by a remarkably bright brass mat and tray. His voice, though husky, is skilled in smooth phrases; he is also skilled in argument. He need be, for though his specimen meets with general admiration, the completion of an order is generally accompanied by a little altercation and a large amount of abuse on the part of the customer. His posing is simplicity itself; and the adjustment of his instrument perfectly bewildering in its celerity. The number of his journeys to the inland bar would require a clever mathematician to calculate. This is such an undoubted fact, that the ordinary Table of Solubilities appears incomplete without the following item:

	Temp.	Water.	Temp.	Alcohol.
Cash Receipts.	Immaterial.	Insol.	At all T's.	Highly Sol.

His education, taste, and capital may be algebraically expressed as x, y, z , an equation with three unknowns; but whatever else may be urged against him, it cannot be said he lets his opportunities go by. His position must be represented in the trade as zero. The above, of course, is a specimen of the lowest of his class. To say that an honest, conscientious positive worker is not to be found would be extreme, but they are unique in their rarity, and generally seek a quiet spot, where their names cannot be tarnished by the juxtaposition of their unworthier brethren, who, as a class, must be mildly considered as degenerate. Leaving the beach-worker to revel in his alcoholic propensities, and ascending to the nearest quiet street, the representative of the second grade makes his appearance in rather an eccentric manner. Advertisements varying in number from ten to thirty appear in every available space, in shop window, door and on the walls of the building, setting forth that artistic portraits can be had beautifully finished at 5s. 6d. a dozen. It is said that a romance repeatedly told becomes gospel in time, even to the romancer. It may be so with these advertisements, the proprietor really believing that what he is continually advertising is indisputably correct. His window is a marvel of uniformity and variety, both.

Rows of cartes and cabinets, tier upon tier in symmetrical profusion, lay claim to the one, while the other is evidenced by the wide range of tones, the faces ranging from ghastly to tropical; the mixture of subjects from the sweep to the ballet-dancer; and lastly, the positions, many and easy, the ballet-dancer in particular looking excessively comfortable with one foot on a very high chair. Within we have a good example of that style of unarrangement known as unstudied. Framed pictures lie about as specimens of "Our Club Portrait." The proprietor is suave and polite; his being no grammarian forms not the slightest check to his volubility. The studio is a trifle bare, but with everything in its place—in fact, everything seems to have taken root and grown there. The instruments are in the fullest sense of the word adjustable, though seemingly of an automatic adjustment. Leaving the pose to the operator, it becomes merely a question as to whether you shall hold a lean pedestal up, or whether the pedestal shall hold you up. The pedestal being the shakiest, you take the safest course, and after a few mystic "passes" the operator retires to develop. The result is more than successful—it always is—so after a few business formalities have been gone through, and you have resisted the temptation to "Try our club," you leave, a happy man. In a few weeks' time you are probably a wiser man, and if there is any inclination left to try the effect of any sort of club, without doubt it will be a war club.

Doubling the price of the foregoing example will give us a representative of the third grade, but luckily price will not form the only distinction here. A strong impression that a plain reproduction of a face is not the sum total of artistic portraiture will be found to exist. The uniformity and variety of the window may be nearly gone, but, strangely enough, there remains something attractive in its arrangement. The quantity of specimens being considerably diminished, the quality is the more apparent. The work shows signs of careful finish, and there is a softness, and roundness, that the eye rests on with pleasure after its former experience. There is still a uniformity—a pleasing one—in the tone and depth of printing, and a decided taste in the selection and character of the specimens shown. The same principles are found to exist inside. You are not told what a splendid portrait you are sure to obtain, but there is an evident anxiety to prove it, and when you see that there are few or no "clubs" about, you feel there is a possibility, or even a probability of it. Politeness and suavity still exist, but of a more intelligent and educated order, and this with the trouble and pains that are taken, cause you to breathe as though in a purer atmosphere. There is, perhaps, an eyesore here and there; a straining after unnatural effect, a tendency to bury the sitter in accessories, a want of character, a want of simplicity and greater breadth, but on the whole there seems an upward tendency, and the impression left is certainly more complimentary to the photographer and his art.

The fourth grade has already been spoken of as the "court" photographer, though this is also merely for distinction, for although many high class photographers have had something of court work, yet there are many who have not. As I speak of a class, court must, therefore, be understood in a general sense. There is, or ought to be, a sensation amounting almost to awe in approaching this class, who have reached the summit of many a lesser man's ambition—a feeling that patent leather, and a little more polish, will not be inappropriate. I will endeavor to step lightly and with circumspection.

The first point that would strike an outsider would be the fact that advertisement is either entirely absent, or nearly so. This may prove many things, but among others, certainly a sense of security and prosperity, it being unnecessary to attract custom by anything approaching vulgar display, an excellent guarantee that this class do not seek, but are sought. To say that their show-rooms, reception-rooms, dressing-rooms and studio exhibit taste of the highest order; that even fashion finds its way into their sacred precincts—that everything is of the completest—all this would be superfluous; and to hint at the presence of anything partaking of ordinary vulgarity would be simply to call into requisition sal-volatile and eau-de-Cologne, and other revivifying necessities. Though many a lesson might be learned from these things, they do not form the fairest subject for comparison. The work itself is, of course, the actual test, and this may be seen by all in the form of pictures of celebrities. I do not mean to say that this work is of the highest order of artistic merit—far from it; but as I am speaking of the work of a class, I wish to take a general sample. Something even the reverse of artistic might be found in many, but there is one grand point, that as a whole they exhibit judicious use of the materials of a picture; there is that combination of tasteful simplicity and worth that stamps the photo as coming from one who has an intelligent appreciation of the powers of photography. Much might be claimed in favor of their subjects, but were these subjects submitted to the ordinary retoucher, photographs of very ordinary mortals would be the result in nine cases out of ten. Posing in the hands of this class becomes easy and natural, even though in some cases it be rather studied; but the same pose on an unsuitable subject, in the hands of one of the lower orders, becomes such an awful and horrible perpetration, that it is a wonder that the friends of the latter subject do not take sudden and immediate revenge. The imitator doubtless has the same idea, but without the feeling that prompted it, and herein lies the strongest distinction of all, for were there no room for the influence of thought and feeling, then a distinct line might be drawn to represent the limit within the reach of all, bearing little or no room for comparisons.

Now, by joining these four examples, and carefully filling in the space between each, an uninterrupted succession of degrees will be shown from first to last, each degree at the same time possessing something original and distinct. From this I want to show that, collectively, progress is evidenced; individually, the reverse. Take, for example, the case of a man starting a business in one of the intermediate stages. He will naturally open according to his ability, but will have still more regard for his capital and surroundings, this point governing his charges. If he be a conscientious worker, he will give full value for money. Having established a connection—which, needless to say, will take time—can he advance his prices so as to improve his work—for he cannot do it otherwise? But rarely; for he cannot do this without a general upset of his whole business, and a fresh start, as it were, on a new basis. On the other hand, there are many things likely to influence him in lowering his prices, and unfortunately the work does not at first follow (it must eventually), thereby bringing his downward influence to bear on his brethren of the same degree. Thus a process of filtration is continually going on, swelling the lower ranks enormously, and leaving the higher ones clear and free, with every prospect of a brilliant future. And then—well, for the peace of mind of the many—"When things get to the worst they generally mend."

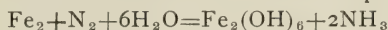
CHEMISTRY OF IRON AND ITS SALTS AND THEIR BEHAVIOR IN PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

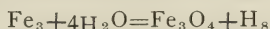
IRON, FE., *Ferrum*.

IRON, the most useful and also the most abundant of all the metals proper, was known in the remotest antiquity. It seldom occurs in the native state except in meteorites, being generally found united to oxygen, to carbon, and, in great quantities, to sulphur. It is an indispensable constituent of the animal and vegetable organisms.

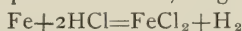
Pure iron has a brilliant bluish luster. It is inalterable in pure, dry oxygen, at ordinary temperatures. In moist air it oxidizes with formation of ammonia, being converted into ferric hydrate, and the oxidation then proceeds with great rapidity, for the oxide and the metal form a voltaic couple.



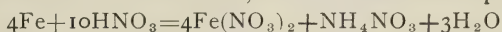
Heated in the air, it becomes covered with a coating of ferroso-ferric oxide. The same action arises when it is heated red hot and immersed in water:



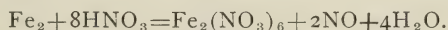
Hydrochloric and sulphuric acid diluted, citric and other organic acids, convert it into ferrous salts by displacement of hydrogen:



With very dilute and cold nitric acid hydrogen is not evolved; it unites with the nitrogen liberated to form ammonia, which neutralizes a part of the acid:



Concentrated nitric acid does not dissolve iron; on the contrary, it produces that singular phenomenon of rendering it unattackable by the dilute acid, but if, after having been several times dipped in the strongest acid, it be immersed in the acid diluted, and then touched with a piece of iron or copper, the action at once commences with evolution of nitrous fumes, and the iron is converted into ferric nitrate, thus:



In its action on iron dilute sulphuric acid forms ferrous sulphate and hydrogen is evolved, as stated above; but when the acid is concentrated and heated, water and sulphur dioxide are formed:



Iron reduces the salts of antimony, tin, bismuth, copper, mercury, silver, gold and platinum. When iron is immersed in a solution of aurous thio-sulphate, $\text{AuNa}_3(\text{S}_2\text{O}_3)_2$;^{*} it is gilded in a few minutes. This process, due to Fordos and Galis, is often employed in the arts to obtain a thin layer of gold on iron, previous to depositing the metal in thicker coating by electrolysis.

Iron forms two classes of compounds: the ferrous salts in which it is diatomic, and the ferrous salts in which it is triatomic.

COMBINATIONS OF IRON WITH THE HALOIDS.

Ferrous chloride, FeCl_2 , is obtained by dissolving iron in hydrochloric acid. The concentrated solution deposits crystals which contain four molecules of water, $4\text{H}_2\text{O}$. It is deliquescent, soluble in water and in alcohol; in the air

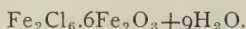
^{*} Prepared by mixing little by little the following solution neutralized with chalk:

Gold tetrachloride.....	1 part.
Water.....	500 parts.
to (not the reverse)	
Sodium thiosulphate (hyposulphite).....	4 parts.
Water.....	500 "

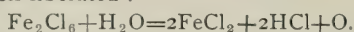
oxidizes into a ferric oxychloride, whose constitution has not been determinated. The oxidation is more rapid in the light.

Ferric chloride Fe_2Cl_6 . This salt, also termed iron sesqui-chloride, is prepared by dissolving ferric hydrate in hydrochloric acid. It crystallizes with $4\text{H}_2\text{O}$. The crystals are very deliquescent, soluble in alcohol and in ether. The aqueous solution has an acid reaction, attacks zinc, copper, silver, etc., and dissolves silver chloride. On account of the former property it is employed in photo-etching and in photogravure. It bites in vertically, with little lateral action. The metal does not, therefore, need much protection to prevent the undermining of the lines.

In the air a solution of ferric chloride deposits a brown powder, having the following formula :



In the light it is reduced to ferrous chloride in presence of organic substances, which absorb the oxygen liberated :



Ferric chloride coagulates albumenoid matters. It is employed as a hemostatic in medicine.

The photographic processes based on the physical and chemical properties of ferric chloride are quite important. In 1860 A. Poitevin observed that it deprived certain substances of their hygroscopic properties and rendered others insoluble, but that these properties were restored, by exposure to light, from the reduction of the salt into one of ferrous. By this observation he was led to the discovery of the well known dusting process, and its application to ceramics, engraving, etc.,* and to that of a process little known among photographers. We refer to his third carbon process. It consists of imbuing a gelatine film with a solution of both ferric chloride and tartaric acid, which renders the gelatine insoluble, and, when dry, exposing under a diapositive, whereby the ferric salt being reduced, the gelatine becomes soluble on the parts acted on, and that *from the surface* and in proportion to the intensity of the luminous action. Hence by development in warm water an intaglio forming the image is obtained whose applications in the art are obvious.†

The cyanofer process of Mr. Henry Tellet evidently originates from this discovery of A. Poitevin. The principle is the same ; the difference resides in the substance employed. A sheet of well-sized paper is coated with a mixture of the chemicals above-mentioned and gum arabic, which latter is rendered insoluble, and, after exposure, it is treated with a solution of potassium ferrocyanide, which, with the ferric chloride not reduced, forms Prussian blue, while in the impressed parts, the ferric chloride being converted into ferrous chloride the gum arabic dissolves in the subsequent washings.

The photo image is therefore formed by the parts not acted on by light and a positive is obtained from a positive but reversed.

The image in Prussian blue can be transformed into black by precipitating ferric oxide from the ferric ferrocyanide with aqueous ammonia (a) and then treating it with tannin (b).

* Ann. chim. (3) vol. xlii.

Bull. soc. franc. phot. 1860, p. 147-212-304.

Traité des impressions photographiques par A. Poitevin, Paris, 1880: Gauthier. Villars, p. 162, et seq.

† *Id.*, p. 191-271.

Bull. soc. franc. phot., 1873 and 1874.

Ferric chloride is also employed for the intensification and the reduction of negatives.* To intensify, the solution should be weak—of a pale yellow color—in order not to dissolve the silver chloride, which, after washing the cliché, is treated in the light with an acid or an alkaline developer.

“In concentrated solution ferric chloride is the most certain and the least injurious means in removing silver stains from the hands.” It is not poisonous.

Iron unites directly with bromine and iodine. The compounds are unstable.

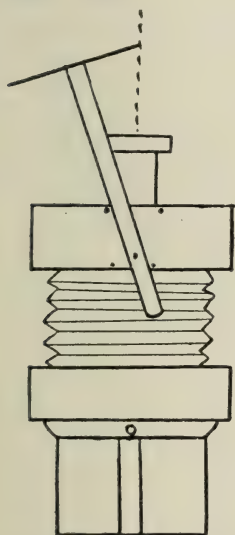
Ferrous iodide has been employed in photography, but not with great success. It decomposes spontaneously into oxyiodide and ioduretted iodide. It is used in medicine. The oxidation of its solution is prevented by the addition of sugar and gum arabic.

(To be continued.)

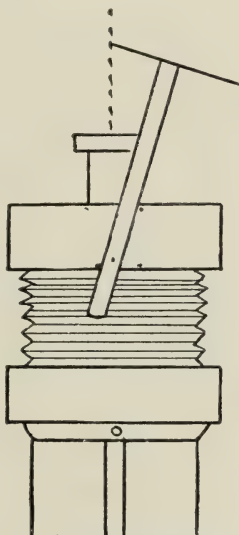
DUPLICATING DEFLECTORS.

To the Editors of the BULLETIN :

DEAR SIRS,—Noticing some lengthy explanation of a method of producing the double exposures, or duplicated pictures on same plate in different positions, I would call your attention to the following : About twenty-five years ago an article for the purpose was sold in market, called “Shive’s Duplicating Deflector.” The price was about \$5, but the machinery so simple that any one should be able to make one for himself. It consisted of a hood or shade, made of heavy card-board, covered with black velvet, a wooden strip or bar, about 18 inches long, and three screws. I sketch it as nearly as I can to give you a better idea.



Position of camera and hood during first exposure.



Same during second exposure.

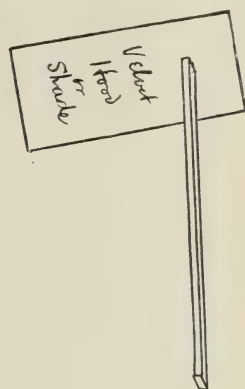


Diagram of hood and bar to which it is attached.

This gives a vertical view of the camera with deflector attached. The black velvet on inner side of the hood allows no action of light on the plate while the other half is being exposed. After the subject has been taken on one half the lens is capped, subject moved to other side of the platform or table, so as to be taken

on the other half of the plate, the deflector moved over, and exposure made. The position of deflector on top of camera, and its movement, must be so regulated that the edges of one begins exactly where the other left off. If it laps, there will be a perceptible line vertically. As each one has to be adjusted to the camera and lens to be used, no regular rule can be adapted, but it is a simple matter to arrange. An adaptation of this could also be made for three exposures or more on one plate, thus taking the subject in three or four different positions on the plate, but for this purpose an opening in the black shade would be better, so arranged as to move exactly the required distance for each exposure. I have never seen an explanation of how the photo was made used in illustrating your BULLETIN some time since, of Col. Pennington, playing chess with himself and watching the game, actually giving three excellent photos of that gentleman, but presume it was by above means.

Yours truly,

SUTSARE REKRAB.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

OFFICE OF THE SECRETARY,
IOWA CITY, IOWA.

To the Photographers of America:

THE Eleventh Annual Convention of the Photographers' Association of America will be held in the Smithsonian Institution, at Washington, D. C., August 12th to 15th, inclusive, and from present indications the attendance will be larger than ever before. Why not take a few days vacation and attend this meeting? If you only knew the treat that awaits you in Washington every photographer in the land would attend, if they had to close their business for a week to do so.

A visit to the places of interest in Washington, the most beautiful city in the world, will alone be worth the time and money spent. The fine collection of paintings in the Corcoran Art Gallery is of special interest to photographers, as it contains some of the finest pictures in this country or in Europe. A visit to the Capitol and government buildings, the Washington Monument, the White House, the Smithsonian Institution, and many other interesting points will add to the pleasure of this occasion and is alone well worth the time and expense of the trip.

The Committee on Railroads have secured a rate of one and one-third fare for the round trip on all trunk lines in every direction. In order to obtain this rate you must obtain a receipt from the ticket agents of whom you purchase tickets on all roads, and have them signed by W. V. Ranger, Second Vice-president, at the Convention. This will entitle you to a one-third fare returning.

The headquarters of the Convention will be at the Ebbitt House, and the following rates have been obtained at the different hotels: Ebbitt House, two in a room, \$2.50 per day; Ebbitt House, one in a room, \$3.00 per day; The Arlington, \$3.00 per day; Millards, \$3.00 per day; The National, \$2.50 per day; The Riggs, \$3.00 per day; The Harris, \$2.00 per day; and many other hotels from \$1.50 to \$2.50 per day, also several on the European plan, rooms from 50 cents to \$1.50 per day.

If you will look at the benefits to be derived from attending this meeting we feel sure that you will take the time and meet with us.

The unveiling of the Daguerre memorial during the Convention, to be permanently placed in the Smithsonian Institution, will be one of the special features. This memorial is a gift of the photographers of America. The fund is raised by one or more dollar subscriptions from the photographers (which it would be well for you to send in your subscription at once to one of the different committees and help the matter along and do honor to the man who first brought to light this noble profession of ours).

You will miss it if you *fail to come*. There will be some of the finest specimens of American photography ever exhibited, as well as European. I have the promises of exhibits from all the leading photographers of the world.

Rules and regulations, list of awards, entries for competition, etc., will be mailed on application.

Is not this Association worthy of your support? Any photographer of good, moral and professional standing is eligible. If not already a member, lose no time in uniting yourself with an organization already a power in the land. It has stood the test of time (eleven years), and has a creditable standing throughout the length and breadth of the civilized world.

To become a member, send five dollars if a proprietor and two dollars if an employee (which pays entrance fee and dues for first year) to the Treasurer, G. M. Carlisle, Providence, R. I. If already a member, kindly remit your dues (\$2), and by so doing avoid waiting your turn at the entrance when you arrive at the Convention, as none can be admitted whose annual dues remain unpaid.

EXTRACT FROM CONSTITUTION.

ARTICLE II.—Section 4.—The annual dues become payable on January 1st of each year, and any member failing to pay the same prior to the adjournment of the Annual Convention shall forfeit his right to membership, and can only be reinstated on payment of an initiation fee (\$3) and (\$2) dues, \$5, as provided in case of admission of new members.

Become a member and get the benefits of the art lectures, practical talks and a grand exhibition of photographic productions and stock exhibit.

Fraternally Yours,

D. R. COOVER,

Secretary.

ANTHONY'S PRIZES FOR BROMIDES AND PHOTOGRAPHS FROM NEGATIVES MADE UPON CLIMAX FILMS.

OUR publishers offer the following prizes in competition at the Washington Convention of the Photographers' Association of America, August 12th to the 15th inclusive, 1890, as follows:

1. For the best collection of Plain Enlargements upon Anthony's Bromide Paper, at least six in number, and not smaller than 11 x 14 inches, \$100.
2. For the best Crayon Worked Enlargements on Anthony's Bromide Paper, at least three in number, and not smaller than 11 x 14 inches, \$50.
3. For the best exhibit of Landscape Photographs from negatives made upon Anthony's Climax Films, not less than twelve in number nor smaller than 5 x 7 photographs, the negatives to become the property of E. & H. T. Anthony & Co., \$50.

Competitors must forward their exhibits, prepaid, so that they will reach Washington, D. C., by August 10, 1890.

Prints may be framed or not, at the option of the exhibitor.

Each package must contain a sealed letter stating the name and address of the exhibitor and his private mark, a letter being also sent to our publishers with same private mark only; but on no account must any other than the private mark appear on the pictures themselves. Instruction as to the class in which they are entered must also be given, and the pictures numbered on the back to correspond with the number given in the class entry. Judgment will be given to the distinguishing mark, but the awards will be announced with both mark and name.

Be sure and ship your exhibits in good time, as those arriving late will not be apt to get a good place, and will run the risk of not getting there in time to be entered for competition.

All exhibits will be subject to the Association rules. All art exhibits must be sent to George H. Hastings, Art Department Photographers' Association of America, Washington, D. C. All charges prepaid.

OUR ILLUSTRATION.

THE handsome silver print which forms the frontispiece of this issue of the BULLETIN is from the studio of Messrs. Gilbert & Bacon, of Philadelphia. These gentlemen have a reputation as artistic photographers that extends far beyond the City of Brotherly Love, and their exhibits at various exhibitions have won for them many trophies as rewards for their skill as artists and photographers. We are very much pleased to have the opportunity to give our readers an example of their handiwork.

EYE-PIECE FOR THE LICK TELESCOPE.—It is said that the Lick Telescope will, in a few weeks, be supplemented by a remarkable piece of mechanism. This is an eye-piece which has just been completed at Rochester, N. Y. No other eye-piece of anything like equal dimensions has ever been made. The largest now in use is not over two inches in diameter, while the new piece measures over 3 inches. The eye-piece is constructed on a perfect theory. There are two lenses, 6 inches apart. The larger one is called the field lens, and is $6\frac{1}{2}$ inches in diameter. The other lens is the eye-glass proper. It is composed of three lenses, a double concave, double convex and meniscus, cemented together. The field lens is of crown glass. The meniscus, or correcting lens, is of flint glass. The light from the heavenly bodies, seen through the Lick Telescope and this new eye-piece, will be 2,000 times as bright as that seen with the naked eye.

ARTIFICIAL ILLUMINATION.—Prof. Langley, says the *Detroit Free Press*, read a paper at Washington on the subject of artificial illumination, in which he advanced a novel idea. He says that all existing systems in a varying degree sacrifice economy, because a very large percentage of the energy used is diverted from the production of light to the useless generation of heat. This is not only a direct waste, but the production of heat is a positive disadvantage. He shows how much better nature does this work in the case of the firefly, and of the luminous infusoria which are seen upon the surface of the sea, and are so numerous, especially in the British Channel, as to have a practical effect in lighting the course of the vessels. He says that the light which distinguishes these insects is produced by a chemical, not by a physical process, and is unattended by any perceptible development of heat. He expresses the belief that a careful scientific study of these insects may lead to the discovery of a means by which the same effect can be artificially produced upon such a scale as to have an industrial value.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by **ARTHUR H. ELLIOTT, Ph.D., F.O.S.**
and a corps of practical assistants.

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Advertisements should reach us not later than the
Saturday preceding the issue for which they are in-
tended, otherwise we cannot promise to publish them
in the succeeding number. It is also necessary to notify
us of any alteration before the date above mentioned,
and to state for what period the advertisement should
be continued—whether for one, six, twelve or twenty-
four issues.

E. & H. T. ANTHONY & CO., Publishers.

ADRIAN CAMERA CLUB.

THE Adrian Camera Club, which organized
last February as a section of the Scientific
Society, has held several interesting meetings,
with discussions upon apparatus, methods of
work, etc.

Many excellent pictures, the work of mem-
bers and others, were exhibited and criticised.

The committee on club album has secured
a number of fine views for the collection.

The chemical room, which will be quite
complete in its arrangements, is ready for
use.

The room is supplied with both ruby and
the combination lights—orange, green and
opal.

The committee on "Annual Excursion" is
having some difficulty in deciding upon
locality for same, owing to the great number
of excellent places in this vicinity. The his-
toric River Raisin passes through our city,
and along its banks may be obtained many
beautiful bits of scenery. Then there are any
number of pretty little lakes surrounded by
a beautiful rolling country, in places highly

cultivated and others quite wild. So we have
an excellent variety. We would be glad to
have members of other clubs join us in this
excursion, which will probably occur in July.

Our regular meetings are held the first and
third Monday evenings of each month.

FREDERICK B. STEBBINS,
President.

POSTAL PHOTOGRAPHIC CLUB.

SEVENTY-THREE pictures make up the May
album, and the members may well feel they
have contributed to one of the best issued by
the Club. Over thirty excellent platinotypes
show the increased interest in this beautiful
phase of photography. The Secretary, Dr.
Mueller, Westchester, Penn., exhibits fine
cattle and roadside studies as well, in albumen.
The two Miss Needles and J. M. Walmesley,
cat photos, as good as they are funny, in
platinum; W. S. Chase, a strikingly clever
portrait of Howells, the novelist; while a new
member, Mr. Phillips, makes good his wel-
come with an excellent platinotype interior.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

REGULAR meeting held June 3d, in the
rooms at 113 West 38th street, Mr. C. Van
Brunt in the chair. The list of donations to
the section having been read and duly
acknowledged, Mr. Mason exhibited a new
hand camera. This, he explained, possessed
what was not found on any other hand cam-
era, a swing-back and a rising front. To
many of the audience these appeared to be
entirely superfluous, it being considered im-
possible to waste time attempting to adjust
either when engaged in instantaneous work.
The camera was fitted with a Dallmeyer lens
and a Prosch shutter.

The chief business of the evening was an
exhibition of lantern slides by Messrs. Smed-
berg and Bock. These gentlemen traveled
over part of the Delaware, Lackawanna and
Western Railroad last summer, carrying four
cameras, and obtained views along the road
between Mauch Chunk, Scranton, Buffalo and
Niagara. These views were taken under all
sorts of trying circumstances, but taken as a
whole they were remarkably good. A chatty
description of each slide by Mr. Smedberg
was much appreciated by the audience.

In some of the slides the sky was of a blue-
color, dotted with fleecy white clouds, produc-
ing a rather pleasing effect. Mr. Bock ex-

plained that this was produced in very much the same manner as a blue print. One of the pictures shown was a panoramic view made from seven negatives. Views of Delaware Water Gap, Scranton from the Hills, the Baggage Room, Scranton, and the approach to Paradise Tunnel, were particularly fine.

Judge Shannon, in proposing a hearty vote of thanks to Messrs. Smedberg and Bock, and speaking of lantern exhibitions, warmly advocated more of them, especially exhibitions of American scenery. These would be incentives to work for amateurs, and would show that we have in our own country views as fine, if not finer, than any on the face of the earth.

This being the last meeting of the section for this season, it was notified that the annual outing would take place in August; the next meeting of the section being in September.

The section adjourned at 10 P.M.

ST. LOUIS CAMERA CLUB.

ST. LOUIS, Mo., May 6, 1890.

THE regular meeting of the St. Louis Camera Club was called to order at 8.20 P.M. by President Collins, with twenty-three members present.

The minutes of the last meeting were read and approved as read.

Messrs. Bion D. Wheeler, L. Kriekhaus, and Dr. Jules F. Valle were unanimously elected to active membership.

Applications from Messrs. Josef B. Wideh and H. A. Siegrist for active membership were read and referred.

Upon motion, Mr. A. S. Aloe was unanimously elected an honorary member of the Club.

The Committee on Field Day not being present, the Secretary read several letters received by them from different railroad lines naming places for excursions, rates, etc., and after some discussion, Glencoe, Mo., which had been selected by the committee, was decided upon as the place, and May 30th as the time of the field day excursion.

The Secretary stated that four prizes, viz., a lens, camera level, dry plates and developer, would be presented to the members doing the best photographic work at and on the day of the Club excursion.

Mr. Butler moved that the lens and camera level be given respectively as first and second prizes in a class open to all the members of the Club; the work to be submitted being a silver print, the negative from which print is made to be developed, and the print to be

made by the member submitting; that the second class receive the other two articles, viz., the dry plates as first prize and the developer as second, this class to be made of those practicing photography less than a year; the work to be submitted being a negative and finished print; the committee to be composed of three, to be selected from our associate members, such committee to be the sole judges as to the work of the members.

Motion carried.

On motion adjourned at 9.05 P.M.

After the meeting the slides of the Cincinnati Camera Club were exhibited.

W. H. WILCOX,

Secretary.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting was held Wednesday evening, May 7, 1890, the *President*, Mr. JOHN G. BULLOCK, in the chair.

The Secretary reported the receipt of an invitation from the New York Camera Club to an exhibition of the work of members, April 14th to 19th; also the 81st, 82d, and 83d Annual Reports of the Pennsylvania Academy of the Fine Arts, and from the Liverpool Amateur Photographic Association a prospectus of an international photographic exhibition, to be held March 6 to April 4, 1891.

The Lantern Slide Committee reported that the slides showed at the April Conversational Meeting were those of the New Orleans Camera Club; slides also being shown by Dr. C. L. Mitchell and Messrs. Carbutt, Dillon, Stirling, Cheyney, and Rosengarten. A communication was also read from the American Lantern Slide Interchange, announcing that the directors had elected Mr. George Bullock, of Cincinnati, Manager, and William H. Rau, of Philadelphia, and F. C. Beach, of New York, Assistant Managers, for the season of 1890 and 1891.

The committee appointed to prepare a memorial of the late President of the Society, Mr. Frederic Graff, reported the following:

Perhaps one of the greatest sources of consolation to those who are called upon to mourn the loss of a friend and leader is the review of his past life as connected with themselves and the interests over which he presided, particularly when those recollections fill us with love, admiration, and respect for the character of our lost friend. We think this will be found pre-eminently the case in regard to our late lamented President, Frederic Graff. We have

been accustomed to see him in our midst for so long a time, presiding over our councils, encouraging us by his example and advice, exciting our zeal in the race by his own untiring interest in our work, and his great desire that our noble art should be more than a casual amusement for the passing hour. His own love for it was genuine. Among the very first to take it up as an amateur, and to apply to it all the energy and resources of his well-trained mind, his interest never flagged, nor did his enthusiasm diminish during his life. We find his name attached to the call for the preliminary meeting, October 19, 1862, to discuss the feasibility of forming a photographic society. At this meeting he was appointed chairman, thus actually presiding over the very birth of the Society. Those of us (now few indeed) who were present at that meeting cannot fail to recall the earnest words in which he urged the necessity of organized action among those interested in photography. We were then a scattered few, groping in Cimmerian darkness that few of those who now enjoy the full glare of the photographic noon-day can realize, each one experimenting for himself, wasting much precious time in arriving at results that some one else had forestalled him in, while he himself was able to supply information as much needed by others. Photographic literature was very limited and inaccessible, and many of the materials used had to be prepared by the operator himself if he desired any certainty in their results. Thus it was that we felt the great need of co-operation and opportunity for the interchange of ideas. At the first regular meeting of the Society, held November, 1862, he was elected Vice-President, which position he occupied until the year 1868, when he was elected President, and continued so until 1870, when his duties as head of the Water Department of the city compelled him for a time to retire from official connection with the Society, but he was always present at its meetings, and his interest in its welfare never ceased. His work as Chairman of the Photographic Department of the Sanitary Fair, held in the year 1864, for the aid of our suffering wounded soldiers, showed how earnest was his desire to succor those who were suffering in their country's cause, and the large returns made by his department are the best proofs of his wise and energetic administration. Again, in 1886, we find him at our head, and he retained the office of President of our Society until his death. On the occasion of his assuming the chair at his election in 1886, after review-

ing the advance made in photography during the last twenty-three years (the Society at that time being so long in existence), he used the following words, showing how fully he believed in the future advance of the art: "And yet we look for more. What shall it be? Who can tell what is to be the future of our favorite hobby? How far will the next twenty-three years of this Society see us in advance? We now make pictures upon a paper-supported film, and develop them into beautiful negatives; may we not hope to have the finished positive impressed in the camera without further development, even then in colors." These words, taken in connection with the recent discoveries made both in this country and in Europe, seem almost prophetic. The Society having now largely increased in numbers, and from the few who assembled for mutual counsel and advice, where formal rules and regulations were not needed, he at once began to urge the importance of a broader and more useful existence, commensurate with the position we should hold in the photographic world. He solicited the members to prepare papers to be read at the meetings of the Society and afterwards discussed. He was always first to draw its attention to any advance in the art, and to his energy and foresight we are, in a great measure, indebted to our flourishing condition and the position we occupy. The social side of his character was not less remarkable. He was always ready to assist with his advice and counsel those standing in need, and his reassuring words have cheered many a fainting heart. Well does one of your committee remember when, after a series of the most disheartening failures, he had almost resolved to abandon his work as a useless waste of time and money, when the words of advice and encouragement he received from him urged him to renewed and more successful efforts. We can all recall the genial influence of his character which seemed to pervade all our informal gatherings and excursions, always ready to contribute his share to render the occasion a success, and by his example making us indeed a united band; and that the spirit which animated him may always be present in the future; and that his example and precepts may excite us to renewed action, is the fervent wish of your committee.

(Signed) JOHN C. BROWNE,
F. T. FASSITT,
GEORGE VAUX, JR.

On motion, it was directed that the memorial be spread upon the minutes of the Society,

and a suitably prepared copy be presented to the family of the late President.

The Committee on Membership reported the election of Mr. Edward Pennock as an active member.

Mr. Joseph H. Burroughs, for the Committee of Ten appointed to consider the advisability of securing more convenient quarters, and the establishment of a working department for the Society, reported that several meetings had been held, but the committee was not quite ready to make a report. He moved that, in view of the importance of the subject, and to avoid taking up the time of a regular meeting with a prolonged discussion, that when this meeting adjourn it be to meet on Wednesday evening, May 14th, to hear and discuss the report of the committee.

Carried.

Mr. Frederick E. Ives sent to the meeting a package of photomicrographs of most beautiful quality, being among the first work of this character he had done. In a note accompanying the prints he stated that they were made with comparatively low-priced objectives, which were not intended for photographic work, and not selected with a view to such use. Some of the plates used were Carbutt "Orthochromatic," others Seed plates treated with erythrosine, and all exposed through yellow color-screens. A small pencil of light was used for amplifications up to forty times, a bull's-eye condenser for medium powers, and condenser of 70 degrees for high powers.

Mr. Cheney, referring to the matter of incrustations on cover glasses of lantern-slides, stated that, having had occasion to remount two old silver prints which had been framed for many years, he found the same incrustation on the glass which had covered the pictures. In this case the cause could not be looked for in any chemicals emanating from the plate. He attributed the incrustation in some way to acetic acid.

Mr. Stirling read a passage from a letter received from Mr. Pancoast, who had been investigating the subject very carefully. He had recently received a letter from Mr. York, the celebrated English slide-maker, stating that the incrustation was due to the use of French or German glass, which contains an excess of alkali, which is acted upon by moisture. With English flatted crown glass the trouble could not occur.

Mr. Coates, who had a large collection of slides made by Mr. York, stated that he had never found the defect on any of these slides.

Mr. Fellows stated that he had experienced the trouble with English flatted crown as well as with the French glass.

Mr. Sartain had frequently seen the deposit on the inner side of the cover glass of daguerreotypes. In this case it was thought that the chemicals used in forming the picture caused the deposit on the glass.

Mr. Stirling, referring to the recent photographic exhibition at Newcastle-on-Tyne,

England, thought the Society had reason to congratulate itself very much on the achievements of three of its members, no less than four medals having been won by them.

Mr. Pancoast won a silver medal for architectural subjects; Mr. Bullock, a bronze medal for landscape work; and Mr. Redfield, a silver medal for figure subjects, and also one for lantern slides.

The best English professional and amateur workers met on equal ground in these competitions, making the result all the more gratifying.

Mr. Francis Burrows showed a French hand camera, in the form of a pistol. It contained a roll of Kodak films, making a square picture the full width of the film. The exposure was made by pulling a trigger, as with an ordinary pistol. The gentleman who brought it over from France had made about one hundred exposures, but owing to some fault in the shutter, which was rather heavy, it had not quite produced a sharp negative, the shutter invariably jarring the camera at the instant of exposure. A register showed the number of exposures made, and two short legs could be turned down in front, forming with the pistol butt a tripod stand for use with time exposures.

Mr. Earle showed a very beautiful camera made by R. & J. Beck, the mountings of which, as well as of the lens, were of aluminium. The reduction in weight, as compared with brass as usually used, was about one-half. A rack and pinion movement operated the back portion of the camera in focusing—a valuable feature, enabling a short focus lens to be used as readily as one of long focus. The front board could be extended by hand to any desired point.

Mr. Walmsley showed a neat and compact camera he had devised for microscopic work. The box was but about four inches square, mounted on an adjustable rim stand, with bellows for attaching to microscope in any position. Anthony's Lilliput plate-holders were used, carrying either plates or films. He had used powers ranging one and one-half to one-fifteenth with equally good results.

Mr. Redfield showed a tripod stand made by Ashford, of Birmingham, England. It was made of teak wood, and so constructed as to be very strong and rigid, and at the same time quite light. The lower leg, by a convenient arrangement, could be drawn up between two of the four upper pieces entirely to the top, shortening the legs one-half, and making the adjustment for uneven ground or to various heights very convenient.

Mr. Hanawelt showed an exposing shutter of his own invention, in which the slide moved horizontally in front of the line. The opening being narrower at top than at bottom, gave one-half the sky as compared with the foreground. By an ingenious mechanism, a sort of crank motion operated the slide, avoiding any jar at opening and closing, and regulating the movement of the slide so that its speed was slowest at the instant of full opening, and quickest at the beginning and close of its action.

Adjourned. ROBERT S. REDFIELD,
Secretary.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—J. F. C. writes: Can you tell me (to settle an argument) which is the proper way to put a view in focus with a camera having a rack and pinion working in front—to get the focus by extending the bellows until you reach it, or extend the bellows as far as you can, and then draw it in until focus is obtained? Opinion is divided, and all agree to abide by your decision.

A.—There is no very material difference whichever way the focus is obtained, but we believe the best method is to extend the bellows and then draw back to the correct focus; by this means any tendency on the part of the bellows to stretch back is obviated, as the return motion is a releasing of any tension backward. With a good clamp screw on the bed of the camera either method should give a correct focus.

Q.—D. D. F., Jr., writes: Will you please let me know, through the columns of your splendid paper, whether washing boxes for plates and paper, made of zinc, would injure plates or paper placed and washed in them for some time. By doing this you will greatly oblige a GREAT FRIEND OF YOUR PAPER.

He also writes: I saw in the last number of the BULLETIN, under the interesting head of "What our friends would like to know," that H. C. T. asks a way of toning blue prints brown or black. I think that he will find the following receipt quite good:

Put the print in the following solution:

Stronger water of ammonia . . .	1 ounce.
Water	8 ounces.

Let it remain in this bath until it loses its color—from two to five minutes—and then rinse it and place it in the following solution:

Tannic acid	1 dram.
Water	6 ounces.

This is made by dissolving the acid and then filtering. Remove the print as soon as the desired sharpness and tone are obtained, but if it is not dark enough in about fifteen minutes it may be intensified by adding a few drops of ammonia. Allow the print to remain a few minutes longer, and then rinse freely.

A.—Washing boxes made of zinc or galvanized iron are very commonly used, and there is

no reason to believe that they will affect plates or prints placed in them, especially if a current of good clean water is kept constantly flowing through. If the prints or the surfaces of the plates were to come into contact with the metallic surfaces and adhere to them for a considerable time, then there would be a danger of reducing action, but not otherwise.

The formula for toning blue prints appears to be a good one, and deserves a trial.

Q.—L. W. W. writes: In a discussion about photography the question arose, what is or was the size of the largest negative ever taken in a camera? A gentleman present said he knew of a negative $6\frac{1}{2} \times 4$ feet. A bet was the consequence, and it was left to your decision about the size?

A.—The largest negative that we ever remember seeing a record of, was made by Mr. T. R. Burnham, of Boston, in 1886, and a direct contact print made from it was exhibited at the St. Louis Convention of the Photographers' Association of America. The negative was 36×60 inches. See BULLETIN, Vol. XVII, page 460. It is probably the largest direct negative in the world.

Q.—C. St. J. McK. writes: Would you please give me, through the BULLETIN, some method of securing and retaining while mounting a high gloss on bromide prints similar to that finish often found on foreign views? I have tried the collodion process given by the Eastman Company, but find it difficult to obtain perfect surface; drying on rubber gives a better finish, but both are lost when the paste is applied or the card dampened to secure the print.

A.—Drying on glass, thoroughly cleaned and dusted with powdered talc or French chalk, which must then be carefully wiped off, will give even a better surface than hard rubber. To retain the glacé finish after mounting, proceed as follows: After having been on the glass just long enough to become set, say five minutes, paste a piece of fairly heavy paper, first moistened and cut to same size as the print, on the back of same while on the glass, and allow to dry and peel off, after which the reinforced print may be mounted on card by pasting on the extreme edges only.

Views Caught with the Drop Shutter.

WE are advised that Thomas H. McCollin & Co., of Philadelphia, have been crowded by pressure of business to such an extent that

they have been obliged to take up new quarters in a large four-story building further up town. We hope they will find the change agreeable.

MR. ABRAHAM BOGARDUS has resigned the office of President of the Photographers' and Artists' Mutual Benefit Society, and particularly desires us to note the fact.

ONE of our southern exchanges, in commenting on the death of Major Marcellus Stanley, of Athens, Ga., calls attention to the fact that our good friend C. W. Motes, of Atlanta, Ga., at one time made himself prominent as a soldier, and when his superior officer was wounded, assumed command of his company and did some of the most heroic and effective fighting of the late war. If his record in that line was equal to that in the photographic field he was a good fighter.

WE have to record the death of Nicholas Briancon Marjollet, who was one of the oldest photographers in New York, having been born in Paris eighty-seven years ago. He was associated with Mr. Charles D. Fredericks from 1853 till the time of his death.

AND still another name of one of the profession who has "gone on," this time Mr. George M. Smith, of Lockport, N. Y., who died suddenly of apoplexy while at his work on the morning of May 10th. Mr. Smith was fifty-two years of age, and well known and loved by all with whom he came in contact.

ON Memorial Sunday the town of Madison, Conn., celebrated the event by a large outpouring of its people to listen to Dr. Reynold Webb Wilcox, the son of the president of the

firm of our publishers, who delivered a thrilling and eloquent address; a martial recitation was rendered by Colonel V. M. Wilcox, his father, and a beautiful flag presented to one of the schools. Mr. S. R. Crampton, formerly connected with the firm of our publishers, took an active part in the memorial services.

OUR publishers received an invitation to attend a dinner tendered by the Scovill & Adams Company to Mr. Ferdinand Salomon, of Dresden, on the evening of May 27th, at the Collonade Hotel, New York. Owing to the absence from the city of Mr. R. A. Anthony, and a previous engagement of Mr. F. A. Anthony, the house was represented by Colonel V. M. Wilcox only. The occasion was a very pleasant one, the gentlemen present being the guest, Mr. Salomon, Mr. W. Irving Adams, President of Scovill & Adams Company; Colonel V. M. Wilcox, President of E. & H. T. Anthony & Co.; W. H. Fuller, W. I. Lincoln Adams, H. Littlejohn, R. S. Lewis, and Charles Ehrmann, of the Scovill & Adams Company. Previous to the dinner an informal reception was held in Mr. Adams' parlors at the hotel, where the company were presented to his wife and daughter.

A FAREWELL dinner was given to Mr. Ferdinand Salomon, of Dresden, at the Manhattan Club on the evening of June 4th, by Messrs. E. & H. T. Anthony & Co., on which occasion a most delightful evening was enjoyed by all present. The gentlemen present were Mr. Salomon, Mr. W. Irving Adams, president of the Scovill & Adams Co.; Colonel V. M. Wilcox, president, and Mr. F. A. Anthony, secretary, of E. & H. T. Anthony & Co.; Dr. Reynold W. Wilcox, Dr. Arthur H. Elliott, and Messrs. E. B. Barker, J. T. Fryer, Dr. Leo Backelandt and W. I. Saundlin, of E. & H. T. Anthony & Co. The menu and all appointments of the dinner were faultless and the occasion one to be long remembered.

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München 1890

Frühling im Walde

München 1890

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

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UNIFORMITY IN LENS MOUNTS.

CONSIDERABLE interest is now being manifested in England in regard to an uniform system of mounting lenses, to be adopted by the different lens makers. For many years the microscopists have had the comfort and great advantage of the so-called society screw for their objectives. This society screw has a thread which is of such a character that an objective bought of any maker will always fit upon the tube of a microscope already fitted with objectives made with this screw. As a consequence no extra fittings or adapters are necessary, and every microscopist can use a lens of any other maker than the one he already possesses, without having to make special changes for the purpose.

This same idea is now being discussed in regard to photographic lenses. It is argued that all photographic objectives of the same lens diameter, or even slightly smaller, could be fitted in mounts having screw threads working into the same flanges for all makers. At the present time even lenses of the same diameter will not fit into the flange if they are made by different opticians. What a comfort and convenience it would be if all lenses, say from $6\frac{1}{2}$ by $8\frac{1}{2}$ down, had screws that fitted into one flange, and that every make of lens of these sizes, $6\frac{1}{2} \times 8\frac{1}{2}$, 5×8 , 5×7 , $4\frac{1}{4} \times 6\frac{1}{2}$, and 4×5 , could all be used with one flange. At the present time, if one wishes to use a different size of lens within the above limits, there are only two clumsy and troublesome methods available. First, to have as many separate front boards fitted to your camera as there are lenses you wish to use with it; or, second, to use a series of brass adapters, one for each lens available for the camera. The first method is clumsy in the extreme, the extra front boards always being in the way when packing the lenses for transportation or storing them for safe keeping. The second method, while less objectionable than the first, is very expensive and troublesome after the adapters have been made. What is wanted is a series of screw threads of such a standard character that every lens maker can use them, and with one screw for a series of lenses. Of course, it would be out of the question to have one mount for all lenses. But two or three lenses that differ only slightly in diameter could be fitted with threads that all screw into the same flange. For example, lenses covering 11×14 , 10×12 and 8×10 plates could all be made to fit into a flange that carries an 11×14 lens tube; and lenses that are smaller than $6\frac{1}{2} \times 8\frac{1}{2}$ could all be fitted with threads to fit into a

$6\frac{1}{2} \times 8\frac{1}{2}$ flange. Perhaps these might be divided differently, and the 8×10 , and lower sizes, could be separated into two groups; but this is a matter of detail for the opticians. What we need is a series of screw threads and flanges so arranged that several lenses of nearly the same size will fit one flange, and every lens of the same size, made by different opticians, will fit the same flange.

Yet another source of annoyance, especially to the traveling photographer, is the tripod screw. Up to the present time there seems to be no easy method of securing the camera upon the tripod except the screw, and every camera manufacturer seems to take a special delight in making every new camera box with a new plate having a thread that is different from every other tripod screw ever before made, and especially different from that of any other maker. There are no other manufacturers using screws that have such an apparently unnecessary diversity of those exceedingly useful means of securing parts of apparatus together. And the time has come when those who will pay attention to these matters and the wants and needs of those that use their wares, will succeed and prosper, while those who do not will most certainly be ignored.

What we need is uniformity in the mechanical parts of photographic apparatus, uniform and simple lens mounts, uniform and correct diaphragms and uniform tripod screws. And we are very glad to note that such men as Dallmeyer, Ross, Beck and others are trying to come to some agreement in the matter as far as lenses are concerned. We also hope that American opticians will see that it is to their interest also to take the same action and let us have an international system.

EDITORIAL NOTES.

In a discussion which followed the reading of a paper by Mr. T. R. Dallmeyer, before the Society of Arts on a recent occasion, on the subject of "Photographic Lenses," which is now being published in the *BULLETIN*, Mr. Beck referred to some of the difficulties to be met with in using the new glasses from Jena, and took occasion to say that their great advantage consisted in the fact that many of them had very high refraction to very low dispersion; that owing to this quality a pair of cemented lenses could be obtained which would more nearly approach to a concentric lens, or would more nearly refract the oblique pencils in same manner as the central ones. While he believed a patent had been taken out on this lens, he doubted if it would hold good, as these glasses could only be made achromatic by using them in the patented manner. The great trouble with the glasses as at present made was that the lenses must be of so nearly the same focus that it was almost a commercial impossibility to produce them, particularly as the glass best adapted to the purpose was not of a nature to stand the action of the atmosphere. The speaker admitted the many minor improvements in photographic lenses since their introduction, but questioned if the principle of astigmatism could be cured to the extent that some were led to hope, and intimating his belief that the remedy depended largely on whether or not the makers can produce a glass which will present greater possibilities.

THE Peekskill Camera Club are hard at work on a set of slides upon "Picturesque Peekskill," and will soon be ready to exchange with other clubs for sets of slides to be used during the coming winter. Clubs wishing to

exchange should address F. H. Southard, 230 Smith street, Peekskill. There is no doubt these slides will be some of the most picturesque views and subjects in New York ; the situation of the Club and the earnestness of its members combined should give a most interesting set of slides for an evening's entertainment.

WE would note for the assistance of such as are having trouble from blisters in their albumen prints at this time the remedy advocated by Mr. W. E. Debenham, who claims that the best treatment is to simply fix in a weak hypo bath, with plenty of it, and a longer time allowed for fixing than ordinarily—his formula being 1 ounce to the pint of water, half an hour's time and a frequent changing about of the prints. The temperature of the bath should not be so low as to be uncomfortable to the hands.

WE note with pleasure in our report of the meeting of the Lens Standard Committee, in another column of the BULLETIN, that there is every chance that a standard of size for lens flanges may be adopted by all the principal manufacturers. Many of the leading optical makers of the world were present and took a lively interest in the movement, and they agreed upon a standard for diameter and number of threads for the two sizes of lens most in use, and expect to reach a decision on larger sizes at their next meeting. When this much-needed reform is instituted both professionals and amateurs will be saved much needless time and annoyance.

WE are in receipt of three views of a pointer dog in the three positions of "sighting the game," "closing in," and "at point," which are quite remarkable in the correctness of position and life-like appearance throughout. The action is exceptionally good. These pictures are from the studio of H. N. Gale, at Bristol, Conn.

THERE will soon be published "A History of Photography in America," splendidly illustrated. This will be an unique work, showing the introduction and development of the art in this country in a new and novel manner. Biographical sketches and portraits of leading photographers, inventors and specialists, who have been, or who are at present, connected with the art, will be given ; also a technical treatise of practical value, a complete list of patents taken out in the United States and Canada, a sketch of the origin of photography in Europe and its present condition at home and abroad, photographic journals, editors and writers, and a variety of novel information of curious interest. In order to make the work as complete as possible, the co-operation of all persons possessing information—anecdotal, biographical or local—regarding the introduction of photography in other cities all over the country, is respectfully invited. Portraits, suggestions and biographical sketches of leading figures, past and present, are requested and will be thankfully received. Those desiring to contribute should address "Author," care *American Art Journal*, 23 Union Square, New York.

IN the photographing of lightning at night, when the camera has been directed to that part of the sky where the expected flash is to come, and through any one of numerous reasons the plate has been exposed to more than one

illumination, it has been found on development to contain not only the image of the last exposure, but one or more mysterious dark images of other flashes. It has not been understood until quite recently that these latter were images of previous flashes, which, if developed before the reception by the plate of the later exposure, would have given pictures of the flashes in their correct values approximately, but which, owing to the double exposure and consequent second illumination of the plate, causes a reversal of the image already registered on it. In view of this fact it is important that after uncovering the lens for a flash, the operator should carefully watch his instrument and cap the lens immediately after the illumination if he would record with accuracy that for which he aims.

WE learn that the Yonkers Camera Club have opened their membership to ladies, and predict that it is a step which will be of benefit to the Club in every way. The Club are also arranging for an entertainment to be given in October, in aid of the monument fund, on which occasion a number of stereopticon views of Yonkers and vicinity will be shown by its members. We wish them every success in their project.

PHOTOGRAPHY has recently been put to a most interesting and instructive use, in connection with the thaumatrope, in recording the various changes in shape and motion of a drop of water during the processes of formation and detachment from the parent body, and its subsequent action on dropping into another body of water. The experiments showed plainly the gathering and gradual lengthening of the drop, together with the slight contraction at the top, which gradually diminishes to a mere thread and is finally broken as the drop is detached and which is always followed by the retraction of the supporting drop.

In falling, the drop assumes a shape varying from a vertical to a horizontal ellipsoid, and carries a vibrating motion similar to that of a weighted spring, and on reaching the larger body of water beneath, rebounds and vibrates in a manner similar to that of the pendant drop at the top. By means of the thaumatrope these motions and formations are beautifully reproduced.

WE have before us a copy of the catalogue of prints displayed at the first Competitive Exhibition of the Lynn Camera Club on May 27, a report of which will be found in another column. The catalogue shows good taste in arrangement, and the number of contributors and the nature of the work as indicated by the subjects shown is extremely creditable.

ONE of the leading members of the craft, Mr. B. J. Falk, of New York, has in his studio a phonograph which serves not only as a novel and extremely attractive accessory, but a means of much interest and of many pleasant memories, inasmuch as few of the many notables who visit him with the purpose of leaving an impression of their features behind, escape without also leaving a record of their voices as well. Mr. Falk has already a large collection of such souvenirs, which is constantly growing, and which he has only to turn on the electrical connection, and they repeat themselves for the enjoyment of himself or his numerous friends who are so fortunate as to be present.

WE have received a very dainty hand-painted invitation to an entertainment given by the Detroit Amateur Photographic Society on May 26th, and in express-

ing regret at our inability to have been present can only say that if the entertainment was at all commensurate with the elaborate finish of the invitations, we must have missed an extremely good thing. The invitations were presented with the compliments of Mr. George R. Angell.

FROM our exchanges we learn of two improvements in the line of photo-mechanical printing processes, the first of which applies to zinc etching and by which the image, after having been transferred to the zinc in the ordinary way, is etched by passing an electric current through the dilute acid in which the plate has been immersed, one terminal being connected with the plate and the other with the acid. The result is a very even and rapid etching of the unprotected portions of the plate, the back of which must of course be covered with asphalt. The second relates to gelatine direct printing and has lately been patented in France by Balagny. A gelatine plate, after being sensitized in a solution of bichromate of potash and thoroughly dried, is exposed behind a negative in a copying frame. After being removed it is exposed to the action of light for some seconds from behind and then washed till all the soluble bichromate is removed; the plate is now ready for placing in an ordinary lithographic printing press, when it may be inked up and many impressions taken from it.

Mr. W. H. JACKSON, the well-known photographer of Denver, Colorado, is now traveling up the Hudson River taking views of the lovely scenery along its banks in the interest of the New York Central Railroad. Those who are acquainted with Mr. Jackson's Western achievements will look eagerly for this new series of views, and we are sure they will not be disappointed in the results.

(From Photographisches Wochenblatt.)

PHOTOGRAPHY IN COLORS.

BY J. GAEDICKE,

THE animation which recently has been given again to the photographic reproduction of colors by the experiments of Veresz has induced me to make some experiments after Poitevin's process.

I changed the same, to simplify the matter, by taking chloride of silver gelatine emulsion paper and letting it become dark-red brown by exposure to light, instead of letting the chloride of silver form under influence of chloride of tin. The paper is now bathed for about two minutes by lamplight (same as with Poitevin) in a solution of equal volumes of a concentrated solution of sulphate of copper and a 5 per cent. solution of bichromate of potassium, when the tone becomes somewhat lighter. It is then dried in the dark, and will reproduce by exposure under colored glasses the corresponding colors more or less good.

The invisible ultra-violet rays will have a disturbing action, and must, therefore, be filtered off. Formerly a glass dish with a solution of sulphate of quinine was applied for this purpose. I simplified this by flowing a glass plate with gelatine which contained a trace of uranium or aesculin. When dry a plate is obtained, which, in its transparency, is almost colorless, but when held obliquely and looked at from the top will appear handsomely greenish blue. These plates absorb the largest part of the ultra-violet rays, so that only the illuminating colored rays pass through.

If the above described dark-brown sensitive chloride of silver paper is now put into a printing frame under different colored glasses, and this is covered with a uranium plate and exposed to diffused daylight, one can observe that the dark film under the yellow glass will become lighter, and is fully exposed in about half an hour. If the result is looked at in lamplight we will find upon a dark brown ground under the ruby glass a pretty bright vermilion-red, under the yellow glass a light pretty brilliant yellow, under the green glass a less brilliant olive green, and under the cobalt glass a dark brown. If the paper is washed several times in water which has been acidified with a little sulphuric acid, and is dried in the dark, the colors will keep quite long if not exposed to direct daylight.

If chloride of silver collodion emulsion paper is used in place of the gelatine emulsion paper, better tones are obtained in the blue, but not such satisfactory results in yellow and red.

The experiments which were made to completely fix the colors (which, however, disappear in hyposulphite of soda) have, so far, been unsuccessful.

I executed my experiments with chloride of silver paper, which I immersed in various salts solutions and then exposed it to light. I succeeded so far that the fixed part of the chloride of silver, exposed to direct sunlight for twenty minutes, remained white, while the parts which had not been immersed became brown at once. Further communications about this theme will follow.

The foregoing information will enable every practical photographer to form an opinion by simply repeating these experiments, how much or how little we have so far been able to accomplish in the production of colored prints.

(From Photographisches Wochenblatt.)

ABSORPTION GLASSES FOR PHOTOGRAPHIC PRINTS IN NATURAL COLORS.

BY DR. A. MIETHE.

If colored pictures upon chloride of silver are to be produced in the printing frame, care has to be taken, as is well known, to keep off the ultra violet light. Glass trays with fluorescent solutions—generally sulphate of quinine—were mostly used. These trays were placed upon the printing frame so that the light had to pass through the solution. This arrangement was very inconvenient; it is much better and preferable to produce gelatine plates which have been colored with a corresponding medium. For other purposes (*vide* "The Actinometry Astron. Photogr. of Fixed Stars," by Dr. A. Miethe) I applied this method in 1888. If a strong fluorescing body—for instance, aesculin—is embodied into a gelatine solution, the latter will fluoresce strongly; but if a glass plate is coated with this solution, the fluorescence will disappear during drying to within a small trace. This can be avoided by adding a little glycerine to the gelatine solution. I work after the following formula:

Gelatine.....	2	grams.
Glycerine.....	2	"
Aesculin.....	0.05	gram.
Water.....	25	c.c.

The gelatine is dissolved in the usual way in 15 c.c. water at a low temperature, the glycerine is added, and then the aesculin dissolved in 10 c.c. water, after which it is filtered through a tuft of sheep's wool. With this solu-

tion the glass plate is flowed pretty thickly, and is left to dry in a place free from dust.

Such a glass now absorbs a considerable quantity of the most refractive ultra violet light, but one part passes through without being absorbed. By spectrographic experiments I determined that the absorption will be almost complete if another glass is added to this aesculin plate, which contains 0.02 gram fluorescence in place of the above mentioned quantity of aesculin.

Such a glass is almost colorless, but it will fluoresce extremely bright green.

As the gelatine film is scratched easily, an aesculin and a fluorescent plate should be placed together film to film, and be bound with black mask paper.

Such plates are pretty constant to light. The aesculin will become brown in the course of time, and then should be replaced by a fresh plate.

CHEMISTRY OF IRON AND ITS SALTS AND THEIR BEHAVIOR IN PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

(Continued.)

SULPHIDES OF IRON.

IRON has a great affinity for sulphur, to which, in presence of water, it unites with evolution of heat and light. The experiment known as the volcano of Lemery demonstrates it.

All the combinations of iron and sulphur are found in nature. The most abundant is the disulphide, FeS_2 , which is employed in the manufacture of sulphuric acid to generate sulphur dioxide and for the preparation of ferrous sulphate by its oxidation in the air.

The monosulphide, FeS , is seldom found native in considerable mass. In the laboratory it is obtained by heating in a covered crucible 2 parts of iron turnings with $1\frac{1}{2}$ parts of flowers of sulphur. It is gray black, soluble in the alkalis and the alkaline sulphides, unalterable in dry oxygen and transformed in moist air into ferrous sulphate. It is employed to obtain large quantities of hydrogen sulphide by the action of hydrochloric or sulphuric acid.

OXIDES OF IRON.

Ferrous oxide, FeO , is a black powder which never has been obtained pure.

Ferrous hydrate $\text{Fe}(\text{OH})_2$ is precipitated as a white flocculent mass by treating a ferrous salt with an alkali. It absorbs oxygen rapidly from the air, being converted first into ferroso-ferric hydrate, then into ferric hydrate.

Ferric oxide, or iron sesquioxide, Fe_2O_3 , is prepared by heating ferric hydrate to a dull red heat.

Ferric hydrate is the red brown powder which precipitates when a dilute and cold solution of ferric sulphate is poured into cold and diluted aqueous ammonia. In operating otherwise a basic ferric sulphate is formed which it is impossible to eliminate by washing. Thus obtained the product is the trihydrate $\text{Fe}_2(\text{OH})_6$, which, desiccated below 30 degrees C., contains various quantities of dihydrate, $\text{Fe}_2(\text{OH})_2$, and is converted into monohydrate, $\text{Fe}_2\text{O}_2(\text{OH})_2$, when dried at 100 degrees C.

Ferric hydrate, freshly precipitated, is the best antidote in case of poisoning by the cyanides. It is also employed as an antidote for arsenious acid.

It should be considered as an energetic oxidizing agent. It oxidizes organic matters, being reduced to ferrous hydrate, and destroys many of them—linen, wood—for the lower oxide, by absorbing the atmospheric oxygen, regenerates it, and the action proceeds anew.*

Coleothar, better known under the name of rouge, is a mixture of ferric oxide and basic ferric sulphate. It is employed for polishing.

Ferroso-ferric oxide, Fe_3O_4 . In the native state it constitutes the natural magnet-loadstone. It is a mixture of ferrous and ferric oxide, $\text{FeO Fe}_2\text{O}_3$ in definite proportions, forming, with acids, ferrous and ferric salts.

CYANIDES OF IRON.

Ferrous cyanide, FeCy_2 , is yellow, insoluble in water. Its properties are not well known on account of its great tendency to oxidize to ferric cyanide. It is formed by treating ferrous sulphate with potassium cyanide sheltered from the light and air.

Ferric cyanide, Fe_2Cy_6 . This compound is yellow-brown and soluble in water. When desiccated 100 degrees C. it occurs as a green powder. It is unstable and decomposed into prussian blue in moist air. Its properties are little known.

These cyanides form with the other cyanides compounds which possess distinct properties, unlike those of the ordinary double cyanides. When formed by the union of ferrous cyanide, they are termed ferrocyanides, and ferricyanides when the ferric cyanide enters into their constitution. These salts treated by an acid give rise to ferro- and ferricyanic acids, which in chemical actions exchange their hydrogen for equivalent atoms of metals.

FERROCYANIC ACID OR HYDROFERROCYANIC ACID, $\text{H}_4 (\text{FeCy}_6)$.

This acid is crystallizable, soluble in water, in alcohol, not in ether; stable when preserved from the action of the air and moisture, otherwise converted into prussian blue and hydrocyanic acid (prussic acid).

It is prepared by decomposing lead ferrocyanide suspended in water, by hydrogen sulphide and precipitating by ether.

Ferrocyanic acid is tetrabasic, forming only one class of compounds.

The alkaline ferrocyanides are neutral, soluble in water, not decomposed by boiling, stable in the air and not poisonous.

Those of the metals proper are mostly insoluble and reduced by heat into metal, nitrogen and carbon or iron carbide.

POTASSIUM FERROCYANIDE OR FERROCYANATE, $\text{K}_4 (\text{FeCy}_6)$ (YELLOW PRUSSATE OF POTASH).

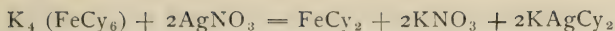
Potassium ferrocyanide crystallizes with $3\text{H}_2\text{O}$ in prisms or tables insoluble in alcohol, soluble in 4 parts of cold water. Its taste is sweetish at first, then salt and bitter.

It unites with iodine. The compound, iodoferrocyanide of potassium, is decomposed with formation of cyanogen iodide by heating the solution.

Chlorine, bromine, chromic acid, and all the agents capable of displacing potassium, transform it into ferricyanide.

The silver salts—chloride, bromide, nitrate, etc.—decompose it thus under the influence of heat:

* The gelatine of carbon tissues prepared with rouge becomes insoluble by this action in a certain period.



Concentrated nitric acid decomposes the ferrocyanide, evolving cyanogen, nitrogen, and a little oxalic acid is formed. When the acid is diluted it is transformed into potassium nitroprussiate $K_2FeNOCy_5$.

Concentrated sulphuric acid decomposes it, giving ferrous, potassic, and ammonia sulphates and carbonic oxide gas.

The dilute acid gives potassic-ferrous-ferrocyanide, hydrocyanic acid and potassic sulphate.

Potassium ferrocyanide forms, in metallic solutions, colored precipitates, which, in chemistry, serve to characterize certain metals.

It is employed in calico printing, in electro-metallurgy, in wood dyeing, and in photography for the development of dry plates.

It may be used as an antidote for the salts of copper.

FERRICYANIC ACID, OR HYDROFERRICYANIC ACID, $H_6 (Fe_2Cy_{12})$.

Ferricyanic acid is obtained from the decomposition of lead ferricyanide by hydrogen sulphide. It crystallizes in red brown needles. Its taste and reaction are acid. It precipitates the ferrous salts in blue, but forms no precipitate in the solutions of ferric salts, which it tinges brown.

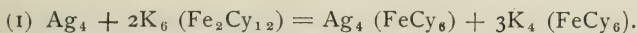
Ferricyanic acid is hexabasic, forming but one class of compounds.

POTASSIUM FERRICYANIDE, OR FERRICYANATE, $K_6 (Fe_2Cy_{12})$.

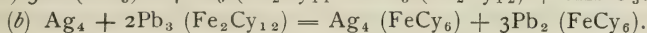
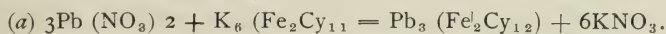
This salt crystallizes without water of crystallization, in rhomboidal crystals of a ruby-red color, unalterable in the air, insoluble in alcohol, soluble in $2\frac{1}{2}$ parts of cold water. The solution, under the influence of light, deposits a blue powder with formation of potassium ferrocyanide; its solution should, therefore, be kept in the dark.

In presence of organic matters ferricyanide is equally reduced to ferrocyanide.

Potassium ferricyanide attacks zinc, copper, lead, mercury, silver, which it transforms into ferrocyanides, it being itself converted into potassic ferrocyanide. This action has been utilized by Mr. E. H. Farmer for the reduction of the intensity of negatives, the silver ferrocyanide being soluble in sodium thiosulphate (hyposulphite).^{*} The chemical changes are represented in the equation following :



Dr. J. M. Eder and Toth apply it on the contrary to the intensification of negatives by treatment with a solution of lead ferricyanide (*a*) which, by acting on the metallic silver, is reduced to ferrocyanide (*b*) and deposits with adherence on the silver salt formed; thus:†



^{*} Year book of photo., 1884, p. 59. The following solution can be employed :

Potassium ferricyanide.....	1 gram.
Sodium thiosulphate.....	40 grams.
Water.....	500 "

† Brit. Jour. Phot., 1885. The solution consists of :

Potassium ferricyanide.....	6 grams.
Lead nitrate.....	4 "
Distilled or rain water.....	100 "

After this the negative is blackened by flowing over a dilute solution of ammonium sulph-hydrate, which converts the metals lead and silver into sulphides.

Other intensifying processes can be devised with metallic ferricyanides. See the table of colored precipitates formed by potassium ferrocyanite (in next BULLETIN).

Chlorine and bromine decompose potassium ferricyanide with formation of hydrocyanic acid, cyanogen chloride and a green ferric cyanide which precipitates by ebullition.

Heated with cupric oxide it becomes incandescent ; with ammonium nitrate it explodes.

In solution with potassium hydrate in excess, it possesses most powerful oxidizing properties. It transforms the oxides of manganese, tin, lead, etc., into peroxides, thus :



[From the *British Journal of Photography*.]

THE ART OF RETOUCHING.

BY REDMOND BARRETT.

CHAPTER II.—MENTAL TRAINING.

THERE are many to whom mental training will not appear as a very necessary help in acquiring a thorough mastery over the art of retouching, but I assure them it is a most essential point. One of the first objects to be attained when we start our studies is what may be termed "intellectual grip." Possessing this, we are able at a glance to estimate to a nicety the many requirements of the negative about to be retouched. One can never be too thoughtful in one's work, and we should treat every new subject as a fresh and independent study. Every human face differs, and as there are endless varieties of expressions thereon, so there must be a special and intellectual treatment for each and every one of them. This we cannot do without thinking. A very considerable amount of the embarrassment, as a retoucher, you will have to contend with in this direction will be vastly influenced by the degree of technical skill and artistic knowledge possessed by the operator upon whose negatives you may be called upon to work.

From a really first-rate operator a retoucher may fairly expect not only a constant supply of good all-round negatives, but also such as will be interesting to work upon. They will possess a certain delicacy of light and shade, the natural result of his efforts to secure some fitting expression which would not only make his work more life-like, but enhance its claims to be classed as artistic. A careful and intelligent retoucher should derive considerable pleasure from working upon such negatives, for they undoubtedly afford him splendid opportunities for the demonstration of his skill and artistic feeling.

I can thoroughly well sympathize with an operator of this class when it is his misfortune to be seconded by a retoucher who either cannot or will not think.

A retoucher who works without thinking cannot produce artistic work. What results can be expected from a man who will simply place a negative on his retouching desk, look for the high light (if any) on the forehead, and start away

"pencil-pushing" (for such it is) until he covers the entire face with what I will even allow to be a creditable "grain" or stipple? Where is the merit of such a portrait? There is no thought for effect, no consideration for the artistic balance of light and shade, and as a natural consequence, no effort whatever to second the operator in his endeavor to secure a pleasant expression. To such a retoucher (?) as this I beg, dear reader, to draw your extra-special and most particular attention. Not that I wish you to cultivate his intimate acquaintance, nor yet make him your "guide, philosopher, and friend," but rather that you may know him as a dangerous companion, and one whose counsels, or the study of whose works, will be certain to have the most damaging effects on your future efforts to master the art of retouching.

I have not the least doubt that there are many who will think that I lay a deal too much stress upon this point; but it is really not so. The fact is, it is impossible to lay too much stress upon it, and believe me, all the attention and study bestowed upon the cultivation of mental appreciation as to the requirements of a negative will be well repaid by a plentiful harvest of successful results in the future. Personally, I consider it of absolute importance to be able to retouch mentally—if I may be permitted the expression—before beginning to use the pencil. Think for a moment, and ask yourself how a student who fails to thoroughly realize the defects and requirements of a negative at first sight can possibly hope to carry out the necessary treatment when he takes up his pencil. He cannot carry out his work successfully. I therefore advise you to thoroughly habituate your mind to diagnose the requirements of the negative before starting work (this will soon become a second nature), and then the very first touch you place upon it with the pencil will have a telling value in obtaining that result already definitely fixed upon in your mind. Consider for a moment what a saving this will be in time. There will be no wandering over the negative purposelessly, and leaving to chance or good luck the issue of your work, but a constant and steady progress toward an artistic end. I have not the least hesitation in saying that a negative thoughtlessly retouched, no matter how pretty the style or method of manipulation may be, will never yield a result possessing real merit, or having any pretensions to be classed among works truly artistic. But in a subject treated thoughtfully, even if the said manipulation be somewhat poor in quality, the general effect possesses considerable artistic value.

The student must here make a note that there is a very vast difference at times between the artistic and the marketable. I regret to have to say so, but I suppose "truth must out." It is in this regard that many writers of known ability on all the scientific branches of photography seem to take delight in running down retouching and retouchers. Considered carefully, however, their writings only show ignorance of their subject and a blind bigotry to see no good in such other branches as are beyond the reach of their own abilities. It often occurs that a retoucher is obliged to make the most absurd alterations and modifications in a face in order to make it suit the taste of his employer, or else to please the capriciousness of the customer. Notwithstanding that the practical retoucher is in many such cases obliged to do violence to his better judgment, the advantages of having acquired his art by means of a proper and artistic training will always assert themselves in his work and prove a strong recommendation. Indeed, there are some of our leading firms—firms, too, some of them

which carry out the wildest ideas in their endeavor to please their customers—that will not employ any but the best procurable talent, refusing to have anything to do with the second-rate man, no matter how low his price may be.

Ladies are sometimes very exacting. They often require not only the most extravagant alterations to be made upon the face, but the hair must be reduced in bulk or lightened in tone, the waist must be reduced and brought to a proportion and shape it may not have had for the past twenty years. It is often suggested as a serious improvement to cut a slight piece off the nose; then a heavy jaw, too, must be reduced (if not altogether taken away); and, in a word, a nice oval appearance given to a face naturally more or less square before being put into the hands of the retoucher. I have had requests from people asking to have mouths closed which were distinctly open and showing the teeth. As if all this were not enough, it will be suggested that the eyebrows may be arched, and so on until scarcely a feature, and in many cases a vestige of a likeness, remains to be traced to the original. Nevertheless, the result of all this chopping and changing is a marketable photograph. The lady likes it, and the photographer, whose likes and dislikes are entirely governed by the extent of his customer's order, is of course highly satisfied. He knows the photograph to be marketable; he tries to make himself believe it is artistic.

Lest the ladies should think I have been unduly hard upon them, I will cite a little anecdote which will, I trust, prevent them from running away with the idea that they possess all the vanities and frivolities of human nature, and that we (noble animals that we are) are above such weaknesses. I can vouch for the truth of this, as it occurred to myself some years ago when I was engaged at one of the leading West-end houses. One afternoon I was called down to the reception room by my employer, and on my arrival he handed me a number of proofs. I then very naturally looked anxiously at the pictures to see what blunder I had made, for I could see there was trouble somewhere. The idea flashed across my mind that I had left a portion of a head-rest showing (a common oversight), or some such blemish; but no, I failed to find any cause for worry. I looked at my governor as much as to say "What is the matter?" "The gentleman does not like them," he said to me in a low tone, and indicated a clergyman who stood close by. I replied by mildly suggesting that "they were very good photographs." The governor knew very well they were, but the trouble was that the customer did not like them, and a rather large order was dependent upon his thinking them satisfactory. I therefore took the matter in hand, and asked the gentleman if there were any alteration possible which could or might make them satisfactory.

Now this clergyman—no doubt a most estimable man, certainly a charming man to talk to—had quite a false idea as to his own personal appearance, and that fact alone can account for his not considering these photographs successful. Dame Nature had bounteously endowed him, as she does all great men, with a very large nose—one belonging to the family familiarly, if vulgarly, termed "soda-water bottle;" also a rather square and heavy jaw, but not so to any objectionable extent. Nevertheless, though not handsome, it was an honest and intelligent face, and one pleasant to look at. Now, he was of opinion, regarding these photographs, that if the nose had been smaller and of a different shape, and the chin rounded off instead of being square, they would have been very excellent portraits indeed. In this, too, his wife, who was with him, concurred.

I need not say I was quite ready to take the order—a new nose and a more delicate chin. The latter was settled easily enough, but some considerable discussion took place before deciding about the nose. Unfortunately, I happened to suggest that any shape could be supplied, hence creating a difficulty of selection; however, after considerable debate, in which we all four joined, it was decided that the more aristocratic Roman should take the place of the more homely soda-water bottle. I went upstairs to my room, taking all the negatives with me, and made the necessary alterations. In due course the fresh proofs were sent, and met with unqualified approval; he pronounced them perfect likenesses (we couldn't see it, but he did), and gave an order for nearly twenty pounds of plain photography, and had a life-size oil painting painted from one. Most decidedly these pictures must be classed as marketable; I am afraid I cannot insist that they were artistic.

Hence you will see that at times, to be marketable, you will have to turn out work that cannot be styled artistic; nevertheless, the better your training the more likely you are to secure success, even in a case like this, for it would have been very easy to have destroyed those pictures altogether. This is only one of many such cases, but it will suffice as an example of some of the many troubles that a professional retoucher must be prepared to encounter from time to time. Foolish as such alterations may seem to the beginner, they require very careful manipulation, backed up by sound judgment, and of these two the latter is really the more important. Of course, such work as this is greatly to be deprecated and only carried out where absolutely insisted upon. In cases where features are somewhat exaggerated in the negative, a wholesale change is often avoided by a skillful softening in the first instance, which will lessen the prominence of the objectionable features and make them more pleasing to the eye.

I will once more impress upon my readers the necessity of cultivating the habit of always thinking as the work progresses, and so hold a complete intellectual mastery over its requirements. Once we have thoroughly secured this quality, we are in a fit state to advance our studies without fear of failing in our efforts to turn out artistic work.

PHOTOGRAPHIC LENSES.*

BY THOMAS R. DALLMEYER.

PHOTOGRAPHIC lenses in general are optical systems for the formation of real images. The perfection of the image, its exact resemblance to the object, and its distinctness, will depend on the exact conveyance of all the rays of pencils emanating from every point in the object into strict mathematical points in the image, or the nearest approximation of such points as may be. If aberration is present, due to improperly chosen curvatures, or improperly combined materials, the resulting image will lose in its distinctness, and may become useless. The object, then, in constructing lens systems, is the best possible destruction of aberrations, both chromatic and spherical. With this in view, we have to consider: first, the proper selection and perfect homogeneity of the materials employed; secondly, the best selection of curves ascribed to the material; and thirdly, mechanically, a strict maintenance of the "figure" (as it is technically termed) of the curves when the material is properly polished. As it will not be

* A Paper read at the Society of Arts.

possible in the time allotted to this paper to touch on the mechanical processes employed, I will mention here that this, of course, is a very important consideration.

Glass is a very perfectly elastic substance, and if, in the processes of sticking the glass on to polishers, the material becomes "biased," however perfectly the curve may then be polished, the glass, on being released from the polisher, will spring back, and the true curve will no longer be maintained, and will give rise to an unexpected appearance in the image, technically termed "unnatural" aberration. Similar effects occur from bad workmanship in polishing, the polish not being distributed equally. Such defects are quite inadmissible, for although not visible by ordinary reflection, the polish appearing very good, a critical examination of the image will show the deleterious effect.

In the application of photographic lenses for ordinary purposes, we ask the instrument to do practically what is theoretically an impossibility. An imaginary perfect lens can only truthfully depict one plane at a time, every other plane being out of focus; when, however, the lens is used under conditions that all rays coming from points in the object are so situated that they are practically parallel; or the circles of confusion in the plane of the image, when removed from the plane for parallel rays, are so small that they are indistinguishable from points visually, the general appearance is one of uniform sharpness. In ordinary lens construction the rays are usually considered as parallel; but in large portrait lenses the means should be given, if sharp images are the theoretical desideratum of correcting the spherical aberration introduced for nearer planes.

There are great advantages, you will be aware, from rapid lenses or brilliant images. Herschell points out that the brightness of an image is proportional to the quantity of light which is concentrated in each point of it; and, therefore, supposing no aberration, as the apparent magnitude of the lens which forms it, seen from the object $\propto \frac{\text{area of object}}{\text{area of image}}$. Or, since the area of the object: that of the image :: (distance)² of object from lens: (distance)² of image; and since the apparent magnitude of the lens seen from the object is as its $\left(\frac{\text{diameter}}{\text{distance of object}}\right)^2$, brightness or degree of illumination of the image is as the magnitude of the lens seen from the image alone, whatever be the distance of the object. Now, the apparent magnitude of the lens seen from the image is always much less than a hemisphere. Therefore (leaving out the loss of light by reflection and refraction), the illumination of the image is always much less than that of the object.

I mention these facts at the outset for the reason that you may clearly understand that it is quite impossible for the lens with a large ratio of aperture to focus, or one that aims at attaining a maximum brightness of image (such as are used in portraiture), also to maintain, at the same time, the uniform qualities above referred to in the lens, the ultimate employment of which is to depict, with sufficient exactitude or definiteness, objects in different planes. With the decrease of brightness, or aperture, comes a reduction of the angle at which the extreme rays cross, increasing thereby the limits through which the plane of the plate may be moved for similar diameters of out-of-focus circles; but, as the depth increases by the proportion, the diameter of the lens is diminished or stop-

ped down, the brightness decreases as the square of the intensity ratio, or the ratio of aperture to focus. As the ultimate applications of various optical systems are at the outset understood, a knowledge of geometry and analysis will enable the optician to construct different forms that shall be particularly suited to the end to be attained.

I take it for granted that you are all acquainted with first principles and first approximations in the refraction of light at plane and spherical surfaces, and are familiar with the fact that the different colored rays of which white light is composed are unequally refracted in their passage through a refracting medium, giving rise to chromatic aberration.

As stated before, our effort is, as far as possible, to destroy in the final image of every system the aberrations arising from spherical forms of the lenses and chromatic aberration. The process necessary to destroy the latter being the easier defined we will approach it first and return to the headings.

I.—THE PROPER SELECTION OF MATERIALS.

It is well-known and easily demonstrated that a single lens cannot be made free from either spherical or chromatic aberration for parallel rays. (A study of the different forms of single lenses and their adaptability to different photographic purposes is very interesting and instructive, and we will run through them briefly when on the subject of spherical aberration.) If, however, we combine two more lenses of different media, we have the means of annihilating both aberrations simultaneously. The elimination of chromatic aberration is rendered possible by the property of refracting substances of dispersing colors in a very unequal degree, though the difference in the refracting power is comparatively slight.

Taking the *D* line of the spectrum as brightest visually, and the *G* or *H* line as that of the most chemically active rays, in order that a lens may be of value in photography—or be actinic—it is most essential that these lines be combined, whatever may become of the rest. Thus, two lines can be combined with two different kinds of glass, and *n* lines may be of course combined by employing *n* different kinds of glass.

For example, take Chance's ordinary hard crown glass, the refractive index for line *D* = 1.517116, and for the line *G*, 1.528348; for dense flint, for line *D*, 1.622411, and for line *G*, 1.646071. The difference, then, between these lines is, for the crown glass, .011232, and for the flint, .023660. The dispersive power of the flint between these particular lines is more than twice as great as that of the crown.

Now, you know that if a number of lenses are placed in contact (supposed infinitely thin), the focus or convergence of system is equivalent to the algebraical sum of the components of the system. It can be shown for two kinds of glass, such as the above; the chromatic aberration can be destroyed, or actinism (the coincidence of chemical and visual foci) be maintained; the glasses must be unequally dispersive, one convergent or positive, and the other divergent or negative. The system can be made free from chromatic aberration, and convergent if the lens formed of the less dispersive power is positive, and is divergent if the lens formed of the less dispersive power is negative. In every case the ultimate rays from the lens converge to form a real image, so that (unless in

the lens system a negative element is introduced as a corrector) it will be found the positive element is always composed of the less dispersive medium.

Recent improvements in glass manufacture necessitate the expressions of "positive" and "negative" elements in lens systems, instead of the flint and crown, and to these I am about to refer. My late grandfather, in a paper contributed to this society on "Practical Illustrations of the Achromatic Telescope," says of glass then known: "The flint is easily distinguished from the crown by its superior specific gravity, arising from the quantity of lead which enters into its composition. Thus, the glass which is called flint glass has, in fact, a smaller proportion of silica than crown. It obtained this title from the care employed in selecting the flint with a view to the purity of the glass, and the term has since become so extensively adopted as to be now almost European." Again, "disks of homogeneous flint glass, more than four or five inches in diameter, are exceedingly rare, and very costly." The advances in the art of glass-making have been very great since that time. By the skill and enterprise of Messrs. Chance, of Birmingham, Pfeil, of Paris, and most recently the elaborate work of Professor Abbe, assisted by Messrs. Schott and Gen, of Jena, the means at the optician's disposal is now placed in a much more satisfactory position.

(To be continued.)

[From the British Journal of Photography.]

THE NEW BENZOLINE LIMELIGHT.

(Continued from page 142)

BY ALBERT W. SCOTT.

III.—THEORETICAL CONSIDERATIONS.

IN carrying out a series of experiments it is necessary to take some theory as a guide. A bad theory is better than no theory at all, for in following it up very often the true principle is brought to light. In forming a theory it is desirable to take into consideration all known facts bearing on the question, then to devise some theory that will explain these facts, and afterwards to test its truth by experiments.

In that little department of science occupied by the limelight in its various forms, several facts, which we may term axioms, are well established.

1. The amount of light emanating from the incandescent lime is dependent in some unknown ratio on the heat of the flame playing upon it: the hotter this flame becomes the more intense is the incandescence, and the more brilliant is the light.

2. The power of the light, when the heat of the flame is constant, varies directly as the area of incandescence.

3. The more perfectly the gases are mixed previous to combustion the more intense is the incandescence, and the brighter is the light; thus the mixed-gas jet is more powerful than the blow-through pipe.

4. In the mixed jet the aperture of the nipple is limited to a certain definite size; but this maximum size varies slightly according to the manner in which the gases are conducted to it, and also according to the kind and quality of the gas consumed.

5. The maximum bore in the case of pure hydrogen is smaller than in the case of coal-gas.

6. The limelights of hydrogen and coal-gas are about equal in brilliancy with the same size of nipples ; but as coal-gas can be used in a nipple of larger bore than is practicable with pure hydrogen, the maximum light of coal-gas is greater than the maximum light of pure hydrogen.

The first axiom relates to the thermometric heat of the flame playing upon the lime ; the second has to do with the specific heat of the flame ; the third indicates a loss of power and waste of gas due to imperfect combustion when the gases are not well mixed ; the fourth axiom depends on the incapacity of flame to pass through small apertures in cold metal ; the fifth and sixth show that the flames of oxyhydrogen and oxycoal-gas have different properties.

Before discussing these matters it will be best to admit that my knowledge of physics and chemistry is by no means profound, and that therefore my remarks are held open to criticism and correction.

The heat of the oxyhydrogen flame is usually stated in scientific manuals to be greater than that of any other known flame ; this I believe to be an error if the thermometric heat is meant, though it is true if specific heat is referred to.

Thermometric heat is the heat which affects the thermometer. A high degree of it melts minute refractory substances, such as platinum ; but it may have little actual quantity of heat or working power ; thus it may have little effect when applied to the boiling of water or production of steam.

A flame having a high degree of specific heat is capable of doing a fair amount of work, such as converting water into steam, but may not be able to indicate a high temperature with the thermometer—not to melt refractory substances.

With the limelight a flame of high thermometric heat will produce a great incandescence and much light from a small spot of the lime, but may not be able to heat a large area of the lime surface. On the other hand, a flame of large specific heat is capable of heating a large area of the lime, but the degree of incandescence may be low and the light poor. Thus two flames may be of the same size, and yet produce different results in the limelight.

The oxyhydrogen flame is produced by the gradual combination of, let us say, 1 pound of hydrogen with 8 pounds of oxygen, mixed intimately together, and escaping from the nipple of a mixed gas jet. There are thus 9 pounds of gaseous fuel, which are changed by combustion or chemical union into 9 pounds of intensely superheated steam. This superheated steam immediately loses its heat, partly by transference to the lime, partly by radiation and partly by convection or dissipation in the surrounding air.

It is not difficult to calculate theoretically the actual temperature of the oxyhydrogen flame. The change of 1 pound of hydrogen and 8 pounds of oxygen into 9 pounds of steam is accompanied by the liberation of 34,400 units of heat (Bloxam). This means, I suppose, that our 9 pounds of fuel are capable of raising the temperature of 34,400 pounds of water, just 1 degree C. ; or if we can imagine such a thing, it is capable of warming 1 pound of water to a temperature of 34,400 degrees above the normal. However, when water is heated to 100 degrees C. it begins to boil, and is converted into steam ; and before the steam can be raised to 101 degrees C. a large proportion of our heat power is expended—viz., 4,833 units. By this loss our available heating power is reduced

to 29,567 units. But even the steam cannot be warmed this number of degrees, for there are 9 pounds of steam produced by the combustion of our stock of fuel, and our 29,567 units must be divided by nine, which leaves us only 3,285 degrees C. of increased heat.

Fortunately for our limelight there is another factor to be considered: the same heat which warms 1 pound of water 1 degree will increase the heat of 1 pound of steam more than 2 degrees. Thus, we finally arrive at the temperature of the oxyhydrogen flame, 6,844 degrees C.

If we calculated the temperature of a theoretical oxycarbon flame in the same manner, we find it is 10,178 degrees C. (Bloxam), nearly half as much again as the oxyhydrogen flame. Pure carbon does not exist in the gaseous form, so far as I know; but compounds of carbon and hydrogen do exist in the forms of coal-gas, and vapors of benzole and petroleum products. The temperature of an oxycoal-gas flame, which may be regarded as a mixture of four volumes of hydrogen gas, one of carbon gas, and four of oxygen, is between the temperature of an oxyhydrogen flame, 6,844 degrees C., and the oxycarbon flame, 10,178 degrees; hence, the coal-gas flame is hotter than the hydrogen flame.

With vapors of hydrocarbons mixed with pure oxygen, the higher the proportion of carbon consumed the hotter is the flame and the more intense is the incandescence. Benzoline has more carbon in it than coal-gas, hence the benzoline limelight is brighter than the coal-gas light.

Benzole, C_6H_6 , has more carbon in its composition than benzoline, $C_{10}H_{22}$, or C_nH_{2n+2} , and therefore the benzole limelight is more powerful than the benzoline light. Experiments confirm this theory, for with a nipple of one-fourteenth of an inch bore, the benzoline light is 40 per cent., and the benzole light is 60 per cent., brighter than coal-gas with the same pressure of oxygen.

POEM ILLUSTRATION.

BY MISS CATHERINE WEED BARNES.

At the meeting of the Society of Amateur Photographers, on Tuesday, June 10th, Miss Barnes read a paper on the illustration of poems. For years painters and sculptors have been the acknowledged delineators of the meanings and thoughts conveyed by poems. But there is no valid reason why photographers should not rank among those who translate into visible beauty the poet's thoughts. It matters little what tools are used if the effect breathes the spirit of the subject.

It is common to see poems illustrated by pictures of buildings and by portraits, but very seldom indeed do these bring out the true significance of the lines.

A model should be chosen carefully, best one with a sense of the artistic, and who can appreciate the beauty of the poems. It is not always possible to make the model fit the picture, but in such cases the picture must be adapted to suit the model.

The subject should be carefully studied and thought over until the spirit of the thing is well established in the mind. Decide upon the accessories required, discarding wherever possible the ordinary studio appliances. Artificial vines and flowers may, however, often be used with good effect. Avoid papier maché walls and chairs, for these are often only too visibly unrealities.

The professional has some one to assist him at his work, some one to operate

while he may give his whole attention to his subject up to the last moment. The amateur on the other hand has to be almost omnipresent, and if not a genuine amateur would never have the courage to do it. Outdoor subjects taken indoors invariably convey wrong impressions, and often do more harm than good. There should and can be no hard-and-fast line as to the mode of studying for illustrations. While working within certain limits these should be stretched as far as is consistent with a proper rendering of the subject. If the model does not suit your conception of the subject, change this latter slightly and adapt it to your surroundings. There should be a sort of magnetic relation between model and operator, each knowing thoroughly what is desired, and both striving in unison to obtain a perfect representation. As an actor forgets himself in his delineation of the character he represents, so the operator and model should sink self in the desire for their picture.

Continuing, Miss Barnes said : Do not try for a perfect likeness of your model, but study for effect. Let imagination dominate your thoughts and your work will have character and originality.

In taking interiors for illustrations it is possible to arrange a ceiling, thus letting all the light come from the side. In the representation of outdoor scenes, it is possible by means of a mirror or a tank of water to introduce a stream into the picture, the reflection of the roof being prevented by a screen of flowers placed above the head of the sitter. Every picture taken will be a guide to the next. Ideas are suggested and new methods of representing certain lines will readily present themselves.

Such competitions as those of the P. A. of A. act as a great stimulus, but it is rather unfortunate that the smallest-sized pictures allowed by them exceed the size used by the average amateur, thus excluding him unless he changes his entire outfit.

The subject of poem illustration is destined to bring about striking changes in our art. It is inconceivably fascinating and will have a great future. Work, steady and painstaking, is needed, and it must be borne in mind that our efforts must be "first, last, and all the time," and that "we judge ourselves by what we feel capable of doing, while others judge us by what we have done."

[From the *Photographic News*.]

A MEETING ABOUT LENS STANDARDS.

THE Lens Standard Committee of the Photographic Convention having publicly asked all photographic opticians interested to meet it at the Mona Hotel, London, to consider the subject of standard diaphragms and flanges, the meeting took place on April 25th. Mr. A. Haddon occupied the chair, and among the opticians present were Mr. T. R. Dallmeyer, Mr. Conrad Beck, Mr. J. Turnbull (Wray & Son), Mr. W. Taylor, Mr. H. W. Hobson, Mr. T. P. Watson, Mr. A. Rayment, and Mr. M. J. Swift.

The Chairman stated that the Committee had been appointed at the Birmingham meeting of the Photographic Convention in 1888, to consider the lens standards of the Photographic Society, and what improvements might be made therein. It had previously done a certain amount of work. The results of their deliberations that evening would be brought before the Convention at its meeting this year in Chester. He hoped that the opticians present would be

led by the voice of the majority. He could not see why photographers should have to carry about in their apparatus a greater weight than is necessary of wood and brass.

The Chairman then distributed some printed copies of the original report of the Lens Standard Committee of the Photographic Society, as follows :

“We, the members of the Committee appointed by the Council of the Photographic Society of Great Britain to consider and report upon the best means of attaining uniformity in the construction of apertures in the ‘diaphragms of lenses,’ ‘flanges’ and ‘camera screws,’ have now the honor of communicating the result of our investigations. Our aim has been, as far as possible, to combine the nearest approach to scientific accuracy with practical utility. Had either consideration exclusively engrossed our attention, modified recommendations might have resulted. Dividing our report into three divisions, the first section has reference to ‘lens diaphragms,’ the second to ‘flanges and adapters,’ and the third to ‘camera screws.’

“*Lens Diaphragms.*—With regard to diaphragms, we recommend—1st. That the aperture of the standard-unit diaphragm should have a diameter equal to one-fourth the equivalent focus of the lens, and be marked ‘1,’ the approximate equivalent focal length of the lens itself being engraved on the mount. 2d. That diaphragms with smaller openings should have apertures diminishing in area to the extent of one-half from the unit standard downwards, and be marked successively 2, 4, 8, 16, 32, 64, etc. These numbers would indicate to the practical photographer that if a given sensitive film requires with the unit stop an exposure of one second, the introduction of a smaller one would necessitate an exposure of as many seconds as the numbers marked on it; in other words, each stop would require double the exposure of the preceding one. Should a lens not admit of a diaphragm with an aperture as large in diameter as one-fourth its focal length, nor exactly any one of the above-mentioned sizes, we still recommend that all the apertures be made in uniformity with the above scale, with the exception of the largest, which should be marked with the number its area requires in relation to the unit diaphragm. In the case of a lens having a working aperture exceeding in diameter one-fourth its focal length, the diaphragm should be marked in fractions (as .5, .25, etc.), in uniformity with the standard apertures, according to the sizes of their relative apertures. We further advise that diaphragms required to be made with apertures intermediate to the standard sizes should invariably be marked with numbers corresponding to the ratio of their area to the aperture of the unit diaphragm.

“*Flanges.*—We advise the construction of flanges with internal and external screw threads of a standard series, for attachment to cameras having screw threads adapted for screws $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3 inches in external diameter, and made with twenty-four threads to the inch $3\frac{1}{2}$ inches. The $3\frac{1}{2}$ inch to have twenty-four threads to the inch on the inside, and twelve threads to the inch on the outside. If larger ones are required, we recommend that they increase in size one inch in diameter, from four inches upwards, with twelve threads to the inch, both internal and external. We also recommend the manufacture of a series of adapters, with inner screws made to carry any existing lens, and with outer ones corresponding to the next or other larger size of the standard flanges above described. Hereafter, whenever practicable, the screws cut on the mounts of all newly-manufactured lenses should be suited to one of the above-sized standard flanges.

Camera Screws.—With regard to camera-screw connections, we recommend that henceforth all screws fitted to cameras either for attachment to the stand, for fixing rising fronts, or for other movable parts, should be either $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$ of an inch in external diameter, and in pitch of thread and other details in accordance with the generally recognized Whitworth standards for the above-mentioned sizes.

“The Council of the Photographic Society of Great Britain, having accepted this report, have directed that a series of standard flanges and camera-screws be constructed and kept in the custody of the Society, and be called ‘The Photographic Society’s Standards.’ Upon application to the Secretary, these standard flanges and screws will be shown, and printed copies of this report be given to those manufacturers of lenses, flanges and camera-screws who may be desirous of adopting the above standards.

“The Gallery, 5a, Pall Mall, S. W., July, 1888.”

Mr. W. Taylor said that he thought the fixing of lens standards to rest entirely with the public. To make a change would involve each optician in much expense, so any change must come by the optician feeling that if he is not up to the times the times will leave him behind. His firm used the standards of the Photographic Society, and did not see that there was any advantage in making a change, for to change a system of lens fittings meant a change of all patterns, the abandonment of old stock, and involved other losses, which few opticians would voluntarily agree to make. Interchangeable screws on gas-pipes are one thing, and lens screws are another; the latter are far more difficult to make, and many of the standard microscope screws in the market are not so well made as would please a good mechanic. They exceed the proper limits of error. In some of them he had found an error of $\frac{1}{1000}$ of an inch, and that was a serious thing. If any society wished to alter the present system relating to photographic lenses, steps would have to be taken to provide members with standard gauges, and the means of correcting those gauges when they began to wear. He thought the Whitworth thread to be good and suitable for lenses. Some photographers wished bayonet fittings for their lenses; such fittings were liable to become unsteady; the turning of them out was not convenient to the lens maker, and they were far more difficult to make interchangeable. The lens screws adopted in the system of the Photographic Society are coarse, and this to some extent meets the requirements of the man who wants a bayonet joint to save time. His firm so made their lenses that any number of them would screw into the same flange upright, and this was a subject which should be considered when dealing with interchangeable fittings. The gauges for making the screws should be true to $\frac{1}{10000}$ of an inch.

Mr. Conrad Beck remarked that in the cutting of standard screw threads for the microscope, the point of the tool wears, so causes an inaccuracy at the bottom of the thread, which in other parts is of the right size; therefore special means have been devised for afterwards cutting out the surplus metal at the bottom of the thread.

Mr. M. J. Swift did not think a little shake in the screw of a lens mount to be worth considering at all; the mount is not particularly faulty if it holds tight.

(To be continued.)

WHEN a man is short he does not remain long at the races.

[From *The Practical Photographer*.]**FIRE INSURANCE FOR PHOTOGRAPHERS.**

It is a curious and unfortunate fact that although photography has progressed rapidly in recent years, and attained the position of an important industry, photographers, as a body, are without any trade organization, and as individuals are often prone to devote their attention more to the scientific and artistic than to the strictly business side of their occupation. The natural result is that photographers lie under certain business disabilities, from which they can only be relieved by concerted action.

One notable case of inequitable dealing with photographers is in the matter of Fire Insurance, a subject which has been again and again mentioned by the various photographic journals, and shelved again as soon as mentioned. Most photographers are aware that the rates for insuring a photographic studio against fire are higher than in the case of an ordinary tradesman—a grocer, a butcher, or a shoemaker. The photographer, in fact, is classed as a dangerous risk. He has been so classed from the early days when he made use of ether, of alcohol, of gun-cotton, and of collodion, and if the time ever arrives when he requires in the practice of his profession no element more inflammable than tap-water he will still continue to rank as a “dangerous risk,” and to pay the rates of the risky class, if he does not rebel.

It is utterly useless for single individuals to complain, and equally useless for an editor to indignantly condemn “the inequitable impositions,” for to reach the heart of an insurance corporation you must touch his pocket. A photographer’s premium, as an individual item, is inconsiderable, but photographers’ business, in the mass, is well worth having; and as a knowledge of the actual attitude of the insurance companies will assist our readers in bringing to bear the power that they possess, and thus insuring more equitable treatment, we have put ourselves in communication with the heads of the principal companies. To some twenty-three of the best-known insurance companies we addressed a letter, of which the following is a copy:

GENTLEMEN,—We frequently have inquiries from our readers with regard to the rates of insurance of their buildings against fire. This arises from an impression very general among photographers that they are unreasonably rated, and we shall be greatly obliged by any information you can furnish upon this subject, as regards the rates of your office.

Taking as an average photographic risk, a brick or stone building, either dwelling-house with studio attached, or business premises including studio, we should like to know how it would be rated as compared with similar premises, not photographic. It rated higher, upon what grounds; and upon what conditions, if any, would a photographic risk be taken at ordinary rates?

Of the twenty-three companies addressed, some have replied to our letters; others have not; but in no single instance has there been imparted a line of real information. They have betrayed the good sense of the wary fish that declines to take the bait. In one case the bait was not perhaps too well fattened. The manager of that good old institution, the Sun Fire Office, replies:

I shall be glad if you will kindly inform me what use you propose to make of the information you ask for. We require to be satisfied as to the *bona fides* of inquirers who are not known to us.

In justice to this gentleman, it must be said that he called to see us, but unfortunately the Editor of *The Practical Photographer* was absent.

The Hand-in-Hand promise to “quote rate” if we will forward a few photographers as sample proposals. The Mutual Fire Insurance Corporation, Limited, reply in similar strain, adding that photographers’ risks “vary very much,” and in like manner our queries are generally evaded. We should have thought that the use we wished to make of the information would have been obvious from our letter and from the editorial memorandum form on which it was written, and we think that it should be patent to any one that any number of rates quoted on sample proposals would be useless to us. What we wish to know is—whether the company addressed charges a higher rate to a photographer as such, and if so, why?

So far as we can make out, the photographer is regarded as “dangerous”

and charged accordingly; and as the majority of the old-established and intensely respectable offices work very amicably together, and do not believe in reducing rates, he is likely to remain in the same position until he bestirs himself.

There are one or two fire offices which are outside the charmed circle of the "old-established and intensely respectable," which conduct their business on independent lines and modern methods. The Economic, for instance, is an office with a scale adjusted to the individual risk according to the opinion of its inspecting manager, which is a much fairer method than that of lumping a whole community and classing it as "hazardous." The Westminster, again, is an office which has given some consideration to photographers, and which has recently issued a special and reduced rate to photographic risks.

(To be continued.)

TO DAGUERRE.

BUFFALO, N. Y., June 18, 1890.

ON the 12th of August, in front of the Smithsonian Institute in Washington, dedicated to manifold arts and sciences, will be erected a lasting memorial to Daguerre—the author that we all know fixed the visible image on a given surface, which is photography, with all its varieties and names, and they are numerous.

Why should we Americans put up such a memorial?

The inscription on the granite below the bronze portrait tells the story :

To Commemorate the

FIRST HALF CENTURY IN PHOTOGRAPHY,

1839–89.

Photography, the electric telegraph and the steam engine are the three great discoveries of the age. No five centuries in human progress can show such strides as these.

ERECTED BY

THE PHOTOGRAPHERS' ASSOCIATION OF AMERICA,

August, 1890.

The monument, now almost complete, its bronze feature being of a high order of art, will stand 16 feet high, and will be the only international monument in the City of Washington, where Smithson himself dedicated his fortune for the advancement of science in the Western world. Like the Statute of Liberty in New York Bay, it should enlist a national sympathy and aid—when now photography is not only a profession but a pastime.

This imposing monument, which will stand beside the Potomac, will represent Fame crowning Daguerre, according to the exquisite treatment of the celebrated sculptor, Mr. J. Scott Hartley. The monument is now far advanced, and the work will be unlike anything yet done on this continent.

Many have been the critics who have seen the design in the sculptor's studio, painters, workers in the plastic, writers and the general public itself—and there is a unanimous concurrence that this tribute is the only appropriate form which an appreciative and befitting memorial could take.

Official recognition of the importance of this monument by the Regents of the Smithsonian Institute, embracing, as they do, the President of the United States, the Chief Justice of the United Supreme Court, and other eminent men in national station, should commend this memorial to the photographer, the amateur and the enlightened citizen.

The officers of the association are making preparation for imposing ceremonies at the unveiling of the memorial, and all those interested in the art of photography should make an extra effort to be present at the opening of the eleventh annual convention to witness the unveiling of the first and only memorial in America to the great Frenchman.

H. McMICHAEL,
Chairman.

Subscriptions may be sent to any of the photographic journals, the merchants, or the manufacturers of photographic supplies.

A NEW PYRO DEVELOPER.

NEW YORK, June 13, 1890.

To the Editors of Anthony's BULLETIN :

FOR the last few weeks I have been using a new developer, without any sulphite of soda, but have not reported until I had a chance to try its keeping qualities. I find it one of the most energetic developers I have ever used for instantaneous exposures. For time exposures it has to be reduced at least one-half or two-thirds with water, and some bromide of potassium solution is added.

The developer is combined as follows, ready for use :

Carbonate of soda (granular).....	10½ ounces.
Water	80 fluid ounces.

When dissolved I add two ounces of the new acid sulphite, and then filter. Lastly, I add one ounce of Anthony's pure pyro, and shake well.

I presume a similar developer can be made with eikonogen. I have tried the above developer on nearly all brands of plates, and with this same acid sulphite in the fixing bath got clear brilliant negatives.

T. C. ROCHE.

EXCURSION TO WASHINGTON.

To the Editors of the BULLETIN :

WE have arranged with the Baltimore and Ohio Railroad Company for those attending the Photographers' Convention, to be held August 12th to 15th, in Washington, D. C. :

Fare from Philadelphia to Washington and return only \$5.34.

The Baltimore and Ohio Company are the first to come forward and offer fast vestibule train service without extra charge.

For tickets and seats in special car to the Convention, address

BUCHANAN, BROMLEY & Co.,
1226 Arch street, Philadelphia.

ANTHONY'S PRIZES FOR BROMIDES AND PHOTOGRAPHS FROM NEGATIVES MADE UPON CLIMAX FILMS.

OUR publishers offer the following prizes in competition at the Washington Convention of the Photographers' Association of America, August 12th to the 15th inclusive, 1890, as follows :

1. For the best collection of Plain Enlargements upon Anthony's Bromide Paper, at least six in number, and not smaller than 11 x 14 inches, \$100.
2. For the best Crayon Worked Enlargements on Anthony's Bromide Paper, at least three in number, and not smaller than 11 x 14 inches, \$50.
3. For the best exhibit of Landscape Photographs from negatives made upon

Anthony's Climax Films, not less than twelve in number nor smaller than 5 x 7 photographs, the negatives to become the property of E. & H. T. Anthony & Co., \$50.

Competitors must forward their exhibits, prepaid, so that they will reach Washington, D. C., by August 10, 1890.

Prints may be framed or not, at the option of the exhibitor.

Each package must contain a sealed letter stating the name and address of the exhibitor and his private mark outside, a letter being also sent to our publishers with same private mark only; but on no account must any other than the private mark appear on the pictures themselves. Instruction as to the class in which they are entered must also be given, and the pictures numbered on the back to correspond with the number given in the class entry. Judgment will be given to the distinguishing mark, but the awards will be announced with both mark and name.

Be sure and ship your exhibits in good time, as those arriving late will not be apt to get a good place, and will run the risk of not getting there in time to be entered for competition.

All exhibits will be subject to the Association rules. All art exhibits must be sent to George H. Hastings, Art Department Photographers' Association of America, Washington, D. C. All charges prepaid.

OUR ILLUSTRATION.

WITH this issue of the BULLETIN we give our readers an example of German photogravure, or kupferdruck, from the works of our good friend, J. B. Obernetter, of Munich, Bavaria. For beauty of execution it leaves nothing to be desired, and the great variety of detail in the scene presented speaks well for the skill of the German photo-mechanical processes. "Spring in the Woods," the title of the picture, is depicted in all its beauty, and with a fineness of delineation that challenges the skill of the best engravers to reproduce in any other manner.

MORE ABOUT BLISTERS.

FORT DUCHESNE, UTAH.

To the BULLETIN:

J. R. SWAIN, of Dana, Indiana, is troubled with blisters. He says they are indigenous to Indiana. I have made prints in Texas, Utah and other localities. I have never used any special precaution, except to have all baths of the same temperature, 75 degrees, and have never seen a blister but once, then by mistake. I poured some hot water on fixed prints. I saw plenty then. I use N. P. A. paper, a silver bath of 55 degrees, float two minutes, fume thirty minutes, wash in plain water—any water from the worst alkali water of Texas to the snow water of this place. I have used all sorts of toning baths, fixing baths from saturated solution to one to eight, sometimes made alkaline, sometimes not. I have made all sorts of prints, good, bad, and indifferent, but never blisters. Indiana is generally low, consequently damp, damper than any place I have ever practiced photography in. It strikes me that the paper Mr. S. uses has been kept too damp and the adhesion of the albumen with paper destroyed.

W. G. W.,

Amateur.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

LYNN CAMERA CLUB.

THE first competitive exhibition of the Lynn Camera Club opened most favorably May 27th despite the usual stormy Tuesday night, at their club house on Broad street. Owing to certain conditions which were required, the members did not have time to prepare the exhibit they would have liked to, and the result has been that only twenty-eight of the over one hundred members were able to make an exhibit.

The two conditions were that no picture should be allowed to enter that had ever before been on exhibition, and that every one be framed. Coming at this time of the year, when the members had done but little work, and what they had done the most of having been on exhibition before, these conditions prevented as large a show as was hoped for. The number of framed pictures shown is fifty-five. Out of these thirty-three are enlargements. They are nearly all framed in oak frames, and hung upon the walls of the exhibition room.

The exhibition is a most satisfactory one.

All of the views shown are excellent, and show to what a high standard the amateur photograph has reached. The attendance of members and friends was quite large.

The judges were W. H. Burbank, of Brunswick, Me., and C. H. Currier and W. S. Briggs, of the Boston Camera Club. They commenced their labors early in the evening, and as fast as they made an award would place little gold stars upon the successful pictures. There were three prizes in each class, and as many different stars designated the order of them.

There were several different classes to which the prizes were awarded, as follows: Kodak enlargements, three diplomas given by the club and a No. 1 Kodak: bromide enlargements, three diplomas from the club and one dozen bromide paper 18 x 22; silver prints, diplomas from the club; contact bromide, three club diplomas; positive film, same diplomas; transparency, same diplomas; platinotype print, club diplomas. The club gave three diplomas to each class for the following merit: One star, first prize diploma for artistic merit; two stars, second prize for artistic merit; and three stars, third prize for technical merit.

The diplomas were very finely made up, having the seal of the club upon them, and after giving the name of the artist and the class and order of the diploma, it reads: "For entirely amateur work by club members at the first competitive exhibition of the club held in the club house, Tuesday, May 27th," and was signed by the three judges.

The first prize of all for artistic merit and also the Kodak was won by J. W. Darcy. His picture was entitled "Spring Saunterings," and represented two ladies by the roadside in the woods; one lady was sitting on a stump. The shading was very fine, and the general effect was excellent. Mr. Darcy also took the second prize in this class. These, like all of the Kodak enlargements, were enlarged from 3 1/4 inches diameter to 14 inches. They were all done in the dark room of the club, where the President of the club, Mr. Drew, had arranged a camera in such a way that any negative can be enlarged to any size required. This is the only one in the city with the exception of one, owned by Mr. J. N. Smith, which was also made by Mr. Drew at the same time he made the club's.

The second largest prize, that for the bromide enlargements, beside the diploma, a dozen 18 x 22 sheets of bromide paper going with it, was awarded to E. F. Bacheller, the popular

Treasurer of the Club, and the picture was well deserving of it. It was of two of Rector Sterling's boys, and presented them laughing, it being called "The Happy Pair." The expression, shade and finish of the enlargement were very fine. A bromide enlargement by Edward L. Rogers, called "In Brookline Woodlands," was a close second, and had more of the print been cut off where there was a slight flaw, it would have secured one of the diplomas. One part of the picture showed a very fine effect. One of the most prominent bromides was that of Dr. E. Williams, entitled "Gim Me a Light," and represented a boot-black with his box and a newsboy standing up with cigarettes in their mouths, one trying to get a light from the other. The doctor got the two boys from the street into the club-room one day and very successfully secured an excellent and characteristic picture. The other views shown by the doctor are also very fine. In the silver prints Mrs. Jeanette M. Appleton, one of the most successful workers of the Club, secured all of the diplomas. Her views were all remarkably fine products of amateur photography, and would make many a professional blush when his work was put beside hers. She is now in Virginia. Mrs. Appleton also took the first diploma on the contact bromide, she having an excellent view of the "Avenue of Pines," Manchester, which showed the finest results almost attainable. The second diploma in this class went to George S. Bliss, in the bromide enlargements. J. W. Coates received the second diploma, he having a very meritorious view of the "Old Mill Dam." N. J. Bacheller took the third diploma in the Kodak enlargement class. A. J. Purinton received the first diploma for positive film, Hermann Lemp first for transparency, and E. F. Bacheller first for platinotype, having the only ones shown. Ray Bartlett, the youngest member of the Club, has a frame of four contact bromides, which, for the first exhibition, show a very fine general effect, and are remarkable for one so young.

A large bromide enlargement of Professor Elihu Thomson, by Hermann Lemp, is also well executed.

There is not a poor picture in the whole exhibit, and the club is to be congratulated upon the result of its first exhibition.

The following is a complete list of the pictures shown, and the stars opposite the name indicate the prize taken, as explained above:

N. J. Bacheller—***Kodak enlargement: The Young Florists.

E. F. Bacheller—Bromide enlargement: *A

Happy Pair, A Young Miss, The Ravine Road. Kodak enlargement: The Mayor's Cow.

Fred E. Bramhall—Bromide enlargement: A Family Group.

A. J. Purinton—Bromide enlargement: An Old Homestead, Haying.

J. W. Goodell, M.D.—Kodak enlargement: Nellie and her Babies, Romeo and Juliet.

E. F. Bacheller—Platinotype print: a. Ravine Road, near Melrose; b. *Ravine Road, near Spot Pond. Contact bromide print: c. Ravine Road, near Melrose; d. Ravine Road, near Spot Pond. Bromide enlargement: e. E. Gloucester Ferry Boat.

W. H. Godfrey—Silver print: Brown, "By Devious Ways," In Paradise. For exhibition only.

Mrs. Jeannette M. Appleton—Silver prints: Gloucester Harbor, ***"Snow Bound," old theatre and Indian figurehead of ship in naval academy grounds, Annapolis, *** A glimpse under the bows of the Constellation, Anna-polis.

F. W. Pope—A. silver prints: Mt. Monadnock, Howlet's Pond, North Saugus, Duck Shooting on Beddington Lake, Reflections on Beddington Lake, Farm Scene at Marlboro', N. H., Farm Scene in Beddington, Me.

J. W. Darcy—Kodak enlargement: By the Wayside, *Spring Saunterings, **Revere Beach Railroad Ferry Slip.

J. W. Coates—Bromide enlargement: ** The Old Mill Dam.

W. A. Pevear—Kodak enlargement: Flash Light Group. Bromide enlargement: Shore of Glen Lewis Pond.

Edward Little Rogers—Bromide enlargement: Little Brook, Dedham; (toned) In Brookline Woodlands.

A. H. Carsley—Kodak enlargement: Lynn City Hall, "Babes in the Wood."

Hermann Lemp—Bromide enlargement: Professor Elihu Thomson, for exhibition only; Papa's Pet, New Year's Day, '88, Middleton, Conn.

J. W. Bowley—Bromide enlargement: Gold Fish Pond; Silver prints, Looking Down Beddington Lake, The Hunter's Camp, The Tired Hunter, At the Beach, The Pet of the House, Gold Fish Pond, Little's Point, Swampscott, Snow Scene, Fay Estate Lodge, Glimpse of Beddington Lake.

F. W. Pope—Bromide enlargement: At Ease, Good Luck Camp.

Ray Bartlett—Contact bromides: A Happy Family, a Woodland Scene near Breed's Pond,

A Woodland Avenue, Lover's Leap Bottling Works.

S. F. Breed—Bromide enlargement: An Old Inn.

A. J. Purinton—Silver prints, self toning: Wood's Road, Magnolia, Fish Houses, The Homestead, Great Frog Boulder. Positive films: West Roxbury Park in Winter, Wood's Road, Magnolia, *Willows, Magnolia, near Breed's Pond, After the Fire. Bromide enlargement: The Fishers.

George S. Bliss—A. Contact Bromides: Reflection Scene, Troy, N. Y., **Ithaca Gorge, Meadow Scene, Northampton.

Miss M. I. Baldwin—Silver prints: Home-liest Dog in Lynn, Apple Blossoms, My Pet.

W. A. Porter—Bromide enlargement: Childhood, for exhibition only.

T. D. Hoyt—Kodak enlargement: Steam Yacht in Boston harbor.

Mrs. Jeannette M. Appleton—Contact bromide: *'The Avenues of Pines,' Manchester; silver prints: Approaching Storm, *Eagle Head Rocks in Winter Head-gear.

Miss M. A. Callahan—Silver prints: A Country House, Saugus River, In the Pasture, The Old Mill, A Wood Road.

Miss J. F. Callahan—Silver prints: Barnyard, After Drinking, "One, Two, Go!" Interrupted, Quiet Chat.

Dr. E. Williams—Bromide enlargements: "Gim Me a Light," Waiting for a Customer, A Quiet Smoke, Lynn Hospital, Consultation of Boston Bootblacks, Snap Shot at Boston Bootblacks, Snow Scene on Washington street, City Gang after a Snow-storm.

Hermann Lemp—Transparency: Home of Mrs. Harriet Beecher Stowe.

THE REGULAR MEETING of the Lynn Camera Club was held at its rooms, 42 Broad street, June 3d, a large number of the members being present. Letters are frequently received by the Secretary, asking for a copy of the club's constitution and by-laws, and it is evident that the remarkable increase in the interest manifested in photography during the last season is to continue, and that the success of the Lynn Club is attracting attention.

The following persons were elected to membership in the club at this meeting: C. W. Pooler, active; W. W. Griffin, active; R. W. Osborne, active; Miss May L. Ash, active; W. P. Ash, active; Miss Grace Niles, active; J. F. Ingalls, social; Benj. N. Johnson, social.

This makes the total membership of the Lynn Club one hundred and ten, and it is now

one of the most prosperous clubs in the country.

A committee, consisting of Mr. Drew, Mr. Fox, Mr. Darcy, Mr. Bacheller, and Mr. Bowers, was appointed to take charge of the preparation of the set of slides, to be entitled "Lynn and Vicinity."

It is the intention of the club to make this set of slides the equal in excellence to any that have been shown during their exhibitions this season, which will demand a high order of artistic merit. The number of views in this set will probably be from seventy-five to one hundred, and they will be accompanied by a descriptive lecture.

The members were called upon to make negatives, or both negatives and slides, and those present responded by agreeing to help make the set a success. It was also decided to make a set of slides from "About Lynn with a Kodak Camera," which, judging from the favor with which it was received, will not be lacking for subjects.

Standing Lantern Slide Committee will, in the future, take charge of all lantern slides and their exhibition.

W. H. Drew was appointed a delegate to represent the club in the various New England clubs, meeting June 17th, at which time a new slide interchange will be organized.

A vote of thanks was extended to N. J. Bacheller and to E. F. Bacheller, who took charge of the club rooms during the exhibition held recently. The meeting then adjourned and will be recalled Tuesday, September 2d.

HARTFORD CAMERA CLUB.

ITS ANNUAL OUTING OVER THE HOUSATONIC RAILROAD.

ALL things seemed to combine on May 30 to make the annual outing of the Hartford Camera Club and its friends a grand success. The perfect weather resulted in making every one go who could possibly get away, and it was a good sized party that left Hartford on the 8.5 train for New Haven. At Meriden and New Haven a number of others joined the party, which, in all, numbered over a hundred. At New Haven the train on the New Haven and Derby Railroad leaving at 9.40 was taken. From New Haven to Botsford was familiar ground to the Camera Club, that being the trip taken last year. From Botsford the train ran to Lanesville over the main line of the Housatonic Railroad, to the officials of which the Club is indebted for its pleasant outing, and there the extra

cars were side-tracked and the party was left to its own devices. A large number of views were taken of the Housatonic River, which breaks through a deep gorge near Still River Station, in a manner somewhat similar to that of the Farmington River at Tariffville. There are several peaks in the vicinity which made the scenery additionally interesting. Many of the party went through the quartz-crushing mill at Still River. Several cameras bear the marks of a tussle with the rocks, and more than one ground glass was broken during the day. In all 436 exposures were made as near as can be ascertained. The party arrived home about 6.50, with the exception of a few who were left in New Haven. The occasion was one long to be remembered by all who participated in it. The names of those who went are as follows:

Hartford—Dr. and Mrs. George L. Parmele, Mr. and Mrs. Elmer M. White, E. H. Crowell, Mr. and Mrs. A. H. Pitkin, W. T. Pitkin, T. W. Hooker, Charles R. Nason, F. B. Lewis, George H. Peters, Samuel Ferguson, Charles G. Stone, Miss Bessie Rathbun, Charles Dexter Allen, Miss Frances L. Clark, Walter Bliss, Miss Hattie Clark, Misses Jessie, Catharine and Mattie Williams (of Indiana), Lieutenant-Colonel and Mrs. Charles E. Thompson, Miss Hattie M. Thompson, Arthur R. Thompson, Harry E. Billings, Frank A. Thompson, Philip J. McCook, Frank B. Day, C. Goodwin, the Misses Anderson, G. Goodwin, Miss Goodwin, Clarence Jagger, Mrs. J. P. Harbison, Miss Mamie Harbison, Mr. and Mrs. Henry W. Fuller, F. S. Havens, J. Coolridge Hills, Miss Grace Smith, Miss Leila Prentice, Knighton Smith, I. H. Ham, C. A. Lovell, Miss L. S. Pease, W. H. Law and daughter, F. D. Berry, Miss Ella Harrison, E. H. Tucker, Elmer C. Quiggle, S. G. Treacy, Miss C. S. Tracy, Miss A. H. Tracy, Mrs. S. J. LeRoy, W. M. Ques- ted, Miss A. M. Cooke, A. F. Evarts, F. W. Starr, E. Starr, Miss Starr, Miss Sternberg, E. R. Kellogg, R. W. Curtis, Mr. and Mrs. Charles Russell Loomis.

New Haven—Miss Gowen, Miss Darrow, F. A. Jackson, C. E. Twichell, C. E. Corn- wall, Mr. and Mrs. F. J. Chatterton, E. R. Slater, C. E. Austin, Mr. and Mrs. Cannon.

Springfield—Messrs. Leshure, Beals, Flet- cher, Smith, Rogers and Bowman.

New Britain—Messrs. Wessell, Wiand, Brown and Shepherd, Miss Shepherd and Miss Gonstra.

Waterbury—Messrs. Beach, C. R. Pancoast, G. M. Chapman, F. B. Youngs and H. W. Hayden.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

THE last regular meeting for this session of the above Society took place on Tuesday, June 10th. The Society having vacated its old rooms and been dispossessed of its new ones, met in the quarters of the photographic section of the American Institute, 113 West 38th street. The meeting was called to order at 8 o'clock by Vice-President Simpson, and after the reading and passing of the minutes Miss Catharine Weed Barnes read a paper on "Poem Illustration," the gist of which will be found in another part of the BULLETIN. A vote of thanks to Miss Barnes was carried with applause.

Mr. F. J. Harrison then exhibited the new magazine hand camera of Messrs. E. & H. T. Anthony & Co. This is a small leather covered box, carrying one dozen plates or two dozen films. The changing of the plates is effected by simply pressing a small button on the top of the camera beneath the handle. By this simple pressure the exposed plate is removed and stored in a magazine below the camera, while a fresh unexposed plate is brought at once into position. A separate box is supplied whereby the camera may be restocked with plates and the exposed ones removed, in daylight. A double finder, time and instantaneous shutter, and a focusing arrangement complete the box, which measures only 10 x 8 x 6 inches.

Mr. F. C. Beach then exhibited an Eastman rollable film, upon which were very distinctly visible "lightning flashes," produced by electrical action between the film and the plate glass upon which the films are set. It is, indeed, a pre-exposure which completely spoils the film.

In reply to the statement of one of the Eastman operators that this was now entirely obviated, Mr. F. C. Beach stated that this particular film was supposed to be perfect, but here was clear evidence that it was not. Another member had experienced the same difficulty with recently purchased Eastman films.

Mr. F. C. Beach also exhibited a plate, once a negative, which by repeated intensification with mercuric chloride and eikonogen had been transformed into a positive. The cause of this was supposed to be the trace of hypo left in the film after washing.

Specimens of the developer "graphol" and of eikonogen, sent by Mr. Cramer, were passed round for inspection.

In reference to the coming of the amalgamated exhibition of societies of this city and others to be held in the spring of 1891, a letter from Mr. Geo. Davison, of the London Camera Club, was read, stating that no doubt many Englishmen would exhibit if the American societies could see their way to an adoption of the methods lately resolved upon on the other side. He hoped that there would be not more than twelve or fifteen awards; indeed he thought that six would cover all branches. The Vice-President then presented the report of the Board of Directors, this being the last meeting of the Society until September 9th. In reviewing their present prospects, Mr. Simpson said he was very sorry upon the first occasion of his taking the chair he should have to tell the Society that they were at present homeless. In February a committee had been appointed to secure new quarters. After much labor, rooms at 12 West 31st street were fixed upon. An agreement was entered into regarding them and an endeavor made to get the Society of Mechanical Engineers to put this agreement into writing. At last a letter was received in which it was agreed to lease the basement and the fourth floor at \$1,500 per annum for three years, with the option of renewal for two years. It was also agreed to do repairs to the value of one year's rental, and several privileges were also granted. After repeated requests for a lease, a draft of the same was drawn up and presented. This contained several items obnoxious to the Society of Amateur Photographers, and a meeting of two committees was held.

Satisfactory arrangements were verbally agreed upon, and acting upon these, several repairs and improvements were commenced.

It was proposed to add codicils to the lease, and twenty-three of these were forwarded. Offence was taken at this, and the photographers' committee were notified that the codicils could not be considered. The President then wrote that, unless amendments were agreed upon, no lease existed. This caused a termination of agreements between the two committees, and the Society of Amateur Photographers were notified that all agreements were now ended. Legal advice was taken, and the matter taken before a judge, who gave a temporary injunction against the photographers. On June 10th notice to vacate was given, the judge deciding that if the President was authorized to sign the lease he had also the power to break it. The Society were now without quarters and advice was asked.

A motion, expressing the fullest confidence

in the committee, and thoroughly indorsing their action, was passed.

Considerable discussion ensued, it being greatly regretted that the President had omitted to consult the committee before risking the lease. It was decided at once to seek new quarters. The meeting terminated at a late hour.

Since the above meeting commodious quarters at 113 West Thirty-eighth street have been leased, and while these are undergoing preparations the former dark rooms at 122 West Thirty-sixth street will be at the disposal of the members.

SOUTHERN TIER PHOTOGRAPHERS' ASSOCIATION.

At the regular annual meeting of the Association, June 2d, W. L. SUTTON, *President*, in the chair, the following gentlemen were elected as officers of the Association for the ensuing year:

President, A. B. Stebbins, Canisteo, N. Y.; *Vice-President*, C. R. Carson, Hornellsville, N. Y.; *Treasurer*, W. L. Sutton, Hornellsville, N. Y.; *Secretary*, H. M. Beeles.

On application F. Donahue was elected to membership and other routine business transacted.

Mr. A. B. Stebbins, retiring Secretary, who has served the Society faithfully since its organization, May 10, 1888, having been present at every meeting, will no doubt be equally acceptable as its presiding officer. He asserts that the Society has been worth a hundred dollars to him, remarking that he had only to point to the Association scale of prices when some customer asserted that he could get his work done cheaper at some other gallery, in fact, his prices are not often questioned now.

He desired to ask if any one knew what had become of the Photographers' and Artists' Mutual Benefit Association, as he had not heard from them lately, and some encouragement had been given that this Association would take membership, and in fact, a representative was expected to visit us at the last quarterly meeting, but had failed to do so. A member had heard a rumor that the Photographers' and Artists' Mutual Benefit Association was defunct.

The Southern Tier Photographers' Association has proved to be the best mutual benefit association, having fixed prices, created harmony of feeling and community of interests not often realized among the near neighbors of our fraternity. It would be a good thing for them-

selves if every photographer within a reasonable distance would join this association, the expense being only forty cents per year.

Mr. Beeles still adhered to his love of eikogen as a developer. On the question of a tariff on albumen paper, opinion was divided, some seeming to think "cheap raw materials" were no advantage to the professional photographer, and the Association determined to allow Congress to fix matters to suit itself. It was sagely concluded that we could do better in the studio than in politics.

H. M. BEELES, *Secretary*.

MR. DAVID TUCKER, the well known merchant of Buffalo, entertained his employees and a number of friends at his residence, on the evening of June 12th. Among those present were J. Stone Armstrong, Damon P. Clark, George L. Congar, Daniel B. Miller, J. Frank Adams, Warren G. Sherk, Fred. J. Gemmer, Charles A. Stacy, L. S. Westover, E. A. Lockwood and J. B. Pelgrift.

ADMINISTRATION BILL H. R. 4,970 has been signed by the President. It puts duties on cases, cartons, etc., and takes effect August 1st next. This will compel the importers of albumen paper to pay for the cases containing the same. We doubt if this will add to the cost of the paper to the consumer.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—C. E. V. writes: I do not quite understand the conditions for prize contest on climax films. They state that a letter is to accompany the exhibit, containing name and private mark. I suppose the latter on outside of envelope and the former on slip within. Also a letter is to be sent to you containing only private mark. This is not quite clear to me. Does it mean that a copy of the private mark is to be sent you with nothing else on paper containing it?

A.—The conditions for competition for the Anthony prizes are that the name and address of the competitor shall be inclosed in a sealed envelope, upon the outside of which there shall appear his private mark, this to be sent to Washington with the exhibit. To our publishers you will send your private mark alone, that they may know that such an exhibit is sent for competition.

Q.—E. O. T. writes: Please answer these questions in BULLETIN: (1) What makes the surface of my prints look dead; water runs off of them as if they were greasy. Does it indicate too long or too short silvering, too strong or too weak bath, too acid or too alkaline? (2) In making bath alkaline with ammonia for the purpose of sunning, and subsequently neutralizing with nitric acid, will the bath in time become overcharged with nitrate of ammonia so formed? If so, how can it be removed? (3) Would a considerable amount of nitrate ammonia in bath cause the hydrometer to indicate correctly, when in reality the bath is weak in silver? (4) After neutralizing my bath with ammonia, if bicarbonate of soda is added an effervescence takes place. Why is it?

A.—We do not quite understand what you mean by the first question; send us some sample prints. Repeated treatment with ammoniac nitrate will surely overcharge the printing bath. It can be removed by evaporating the bath down and heating until it stops foaming, the ammoniac nitrate being decomposed when strongly heated, giving nitrous oxide gas and water vapor. The hydrometer is useless as an indicator of the strength of the bath in silver if the bath contains any ammoniac nitrate. We do not understand the cause of the effervescence on adding bicarbonate of sodium, unless your bath is hot when you add it. In that case the effervescence comes from the decomposition of the bicarbonate by heat, giving simple carbonate. If the bath is cold it comes from imperfect neutralization with ammonia. Are you sure your test-paper is sensitive?

Q.—C. E. K. writes: Thanks for answers given in one of your late journals to my questions. Now, I wish to ask another one or two. Can you give me a formula for toning that will give me blue tones? I have tried the way of acidifying my prints with acetic acid before toning, and then using the bicarbonate bath. Also, using the toning formula given in one of your journals, *viz.*, wash in ammonia water by testing with litmus paper, and then toning in a bath as follows:

Gold chloride..... 2 grains.
Salt 12 "
Water..... 5 ounces.
See BULLETIN of January 11, 1890.

This gives the blue tones, but when I put them in the fixing bath they turn red. How can I use the gold thrown down from old baths without sending it to the refiner? Also, how can I test so as to tell how many grains to ounce? Can you tell me where I can get the books called "How to Sit for Your Picture?" They are in small form.

A.—To preserve your blue tones in the fixing-bath add about one fluid dram of ammonia to a quart of bath. The following toning-bath also gives strong blue tones:

Gold chloride..... 2 grains.
Chloride of lime..... 2 "
Chalk (fine powder)..... $\frac{1}{2}$ ounce.
Water..... 16 ounces.

Use hot water and the bath will be ready for use after allowing to cool; if cold water is used wait twenty-four hours. We do not know any good method for using up precipitated gold that is not more troublesome than refining. To test the value of gold waste requires skill in assaying. The book you mention we do not know. Send the name of the publisher, and the publishers of the BULLETIN will furnish you with it if obtainable.

Q.—H. W. H. writes: Please tell me how much acid sulphite to use in place of sulphite of soda in annexed formula:

No. 1.

Sulphite soda..... 2 ounces.
Eikonogen..... 1 ounce.
Water..... 40 ounces.

No. 2.

Carbonate of potash..... 1 ounce.
Water..... 10 ounces.

A.—Use acid sulphite solution one fluid ounce for every two ounces of sulphite of soda in any formula of the above character.

Views Caught with the Drop Shutter.

LEAVITT S. APGAR, 517 Fulton street, Brooklyn, sends us a handsome photograph of a colored boy, and one of the best we have seen. On the back is a list of prices for making prints, developing plates, bromide paper, etc. The rates appear reasonable and the work is well done.

A GRACEFUL compliment has been paid to the granddaughter of Nicéphore Niepce at the last meeting of the Société Française de la Photographie. Some time ago it was decided by the French Government, on the recommendation of the Société, that a Jubilee medal should be struck and engraved in honor of the fiftieth anniversary of Daguerre's discovery; and it was decided by the Société that the medal should be presented to Mdlle. Niepce on the occasion of her marriage.—*Photographic News*.

In *Burgeyne's Monthly Circular* for this month, bichloride of platinum is quoted at twenty-eight shillings an ounce, nearly double the price it bore a few months ago.

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NEGATIVE BY W. L. SCARDIN,

PRINTED ON H. P. A. EXTRA BRILLIANT ALBUMEN PAPER.

SNOW SCENE, PROSPECT PARK, BROOKLYN,

ON THE MORNING OF MARCH 20, 1880.

ANTHONY'S Photographic Bulletin.

Prof. **CHARLES F. CHANDLER**, Ph.D., LL.D., *Editor*.

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor*.

JULY 12, 1890.

Vol. XXI.—No. 13.

CHROMARTOTYPE.

THE various efforts that from time to time have been made to reproduce directly or indirectly the natural colors of objects and paintings by photography have always proved extremely interesting to those who are watching the progress of the art. Early experimenters used photography to reproduce colored objects directly. The discussion of a revival of these processes has lately occupied a large space in the photographic journals, but as the results are but little in advance of those made a quarter of a century ago, we need not now stop to notice them.

Another set of experimentalists attacked the question from another position. Ducos du Hauron, in France, and others endeavored to reproduce colored objects in colors by the aid of photography in an indirect manner. They sought to separate the various colors that make up a picture and then to take a negative of each component color. These negatives served for the production of plates that carried the color, which by superposition served to reproduce the picture in its original tints.

Efforts of this character were made by Joseph Albert, of Munich, the inventor of the Albortype process, and with considerable success. Obernetter, of Munich, also has done some excellent work in this direction, giving us photographures in colors of a high order of merit. Others also have worked in the same direction, but there has generally been something lacking to give the reproduced picture the character and beauty of the original.

In the efforts of Joseph Albert we have hitherto had the best results in his Albortype prints in colors. These, and also those by other experimenters, were made by using light filters; that is, a negative was taken through a yellow glass, to give only the yellow parts of the picture; another through a red glass, to give only the red parts, and a third through blue glass, to give the blue parts. By making gelatine printing plates from the negatives thus produced and using pigments, the three primary colors, red, yellow and blue, could be combined to reproduce the picture in its original color combinations.

The pictures thus reproduced were nearly always lacking in softness and the blending of tints that gives character to a picture; and this was about the best that could be done until quite recently.

For a number of years Edward Bierstadt, of this city, has been identified with the artotype process for the reproduction of pictures in black and white. His work is without a rival in the particular line he has made his own. During his

studies to perfect the artotype process he has also repeated much of the work of Ducos du Hauron, Joseph Albert and others, in the direction of reproducing colors by the indirect aid of photography. Until about three years ago his efforts were no better than those of the earlier experimentalists, but working patiently and enthusiastically in this same direction he has now achieved results that are truly remarkable. We have before us a print reproduced by Mr. Bierstadt that appears wonderfully true to the colored picture from which it was made.

The picture represents a view in one of those interiors of the Dutch school of artists that gave such a character to all their work. We are not sure of the name of the artist, but believe it is Jan Steen. In the picture the foreground is occupied by a table with four male figures, two singing, one playing a flute, and another a mandolin. In the distance looking through a doorway is a female figure evidently listening to the music with great interest. Other objects make up a peasant interior of the Dutch school of art. The tones of the picture are generally low. Neutral gray tints, browns and reddish oranges make up the more prominent parts of the picture, and all these are blended with a softness and beauty that is truly fascinating to the eye of the observer. In fact, the picture has all the characters of a painting, and if it was thinly varnished the reproduction would be exceedingly difficult to recognize as such.

The method adopted by Mr. Bierstadt to attain this remarkably beautiful result is probably the outcome of his studies in orthochromatic photography; for in addition to the use of yellow, red, and blue light filters, he uses a fourth filter, which is neutral tint. By this latter device he is able to give the true value to the lights and shades in a picture: in a word, true orthochromatic effects. No work of any kind is done upon the negatives or the printing plates, each negative being used just as it comes from the developer. The only care needed is the proper selection of the light filters. The results obtained by Mr. Bierstadt are so certain that he can prepare the chemicals, the four negatives being made according to his directions, and he will reproduce the proper colors in the finished print, without seeing the original. This is certainly a truly remarkable achievement, and we hope that the industry and patient experimenting of many years will bring Mr. Bierstadt a substantial reward.

If we can persuade Mr. Bierstadt to undertake the task of illustrating the large issues of the BULLETIN, we may give our subscribers a specimen of this latest development of applied photography.

EDITORIAL NOTES.

A PAPER of great interest was read by Dr. Burton Sanderson, before the Royal Society of Great Britain in May last, on the subject of "Photographic Determination of the Time Relations of the Changes which take place in Muscle during the Period of so-called Latent Stimulation." As the result of the last forty years' study and speculation on this subject, it has generally been conceded that about the one-hundredth of a second elapsed between the excitation and contraction of the muscle, but by the experiments carried on by Dr. Sanderson, it was demonstrated that the time is only the four-hundredth part of a second. In order to demonstrate his theory, Dr. Sanderson projected the movement of the muscle through a vertical slit, on a sensitive plate, which is moved by an equi-

librated pendulum. The slit is also gauged with a tuning fork, and records the motion of a signal.

By adjustment of the plate and slit, and a comparison with the vibrations of the tuning fork, the correct time of movement is arrived at.

WE note with much pleasure that the Photographic Society of Philadelphia is making rapid advances toward having its own permanent abiding place, and congratulate it on the prospect which seems opening before it. A committee of its live and efficient members has been appointed to secure investments, and it is the purpose of the Society to form a syndicate which shall buy or build, in a suitable location, a house adapted to the growing wants of the Society. The committee is made up of Messrs. John Carbutt, Charles L. Mitchell, M.D. (Secretary), Frank H. Rosengarten, W. A. Cheyney, W. D. H. Wilson, Samuel Sartain, Frank Bement, Louis A. Reichner, Jr., Edmund Stirling and William H. Rau.

WE are pleased to observe that a new field seems opening to the ladies in the higher lines of applied education. The Greenwich Observatory has lately appointed four ladies to positions on its staff, their work being the taking and measuring of photographs for the international chart of the heavens. This appointment is something entirely new, but if the appointees show the ability which is expected of them, there is no doubt but that it will do much toward opening other avenues for their employment.

Dr. EDER, of Germany, in *Correspondenz* says: Herr L. Manifier, in Vienna, has produced, for some time, peculiar transparent gelatine films, which are smooth on one side, but are provided with a relief grain on the other. This sheet is stretched upon a small wooden frame, and receives the ink on the grained side by means of a small roller. If laid upon a piece of transfer paper, with the inked side down pressing at the same time moderately on the back with finger nail or pencil, the ink from the relief parts of the gelatine sheet will act on the transfer paper underneath, and one obtains a simple lining or grain, which, by repeating the operation and crossing the sheet, will appear as simple or crossed grain. These gelatine sheets, which serve for grain drawings, are called by Herr Manifier "Tangier" plates, and are patented by him. The purpose is production of drawings for reproduction purposes upon a suitable transfer paper. Herr Manifier applies only smooth paper, upon which the drawing in the contours is made, as ordinarily, whereupon the half tones and shades are put in by bringing the paper in contact with the inked tangier plates. By crossing the line plates, as well as by application of grain and dot plates, any suitable grain can be brought into the drawing.

It is hardly to be wondered at that Japan seems destined to take such a prominent place in photography, when we think that she has always worshiped the Sun-Goddess; and its representative, the burnished mirror of bronze, is still such an important household article, and plays such a prominent part as it does in the social economy of the country.

A POINT of interest to users of celluloid films is brought to light in one of our exchanges, to effect that the various makers of these films coat the celluloid on

different sides, some maker preferring the matt surface as a body for the sensitive emulsion and other coating on the polished side. Of course it behooves the user to familiarize himself with the method followed in the films he uses, as otherwise it will be an easy matter to place it in the holder "wrong side out," which would be most unfortunate, though from just such a blunder as this our exchange procured some negatives through the films which had the quality of being unusually free from halation. This point may be worth investigation, and by the way, the exchange spoke particularly in praise of the Climax negative films which are made by our publishers.

At the excursion of the New England Camera Clubs on Narragansett Bay last month, a report of which is in our columns, the representation was very large and enthusiastic, the following long list of clubs represented, showing the amount of interest taken in the art by New England. Boston Camera Club, Lynn Camera Club, Lowell Camera Club, Worcester Lantern Slide Club, Springfield Camera Club, The Camera Club, Hartford; Photo Section New Britain Scientific Association, Photographic Society of Waterbury, Providence Camera Club and Brookline Camera Club.

Mr. D. C. HASBROUCK, of Peekskill, N. Y., has been very successful in some recent exposures on a flash of lightning, one of his best negatives showing the forked flash with great brilliancy, and depicting the distinct branches and the enlarged shape of the main trunk as it neared the earth in a most interesting manner.

FROM our foreign exchanges we learn of a new process of electro chemical etching, which is adapted to metals having a much harder composition than zinc even. As is well known, it has been almost impossible to etch the harder metals with clear cut lines, but by the method referred to it is claimed that this difficulty is entirely obviated. The metal surface to be etched, which may be either flat or curved in shape, is carefully polished and the transfer made in the ordinary manner and dusted with powdered resin, after which the surplus powder is removed and such as is retained adhering to the lines of the transfer is melted by application of a Bunsen burner and heater, on which the plate is placed. The back of the plate is then coated with asphalt and it is immersed in the etching fluid, which is contained in a stone or earthenware bath, and is composed of a dilute acid, which is likewise a good electrical conductor. Of course the composition of the bath in detail must vary according to the metal which is to be etched. The plate itself serves the purpose of one electrode, and for the other a carbon plate is arranged parallel to it and facing the surface of the metal plate which is desired to be etched. If a current is now turned on from a dynamo of 200 ampères, and the circuit completed, it will be seen that the parts of the plate unprotected by the resin adhering to and melted into the lines of the transfer are attacked and a rapid process of chemical decomposition ensues, which shortly eats to a depth sufficient to leave a printing plate, and the lines will be found to be sharp and clean. Rinsing from time to time enables the operator to observe the depth to which the etching has been carried, and as in the case of ordinary zinc etching, the plate may be stopped in portions at any stage, by the application of more resin and melting it in.

A NEW and rather surprising use has been discovered and patented by Mr. C. H. Koyl, of Euston, Pa., for celluloid. By silvering the back of a sheet of this material Mr. Koyl has succeeded in producing a looking-glass, which is not only of excellent quality, but is much less destructible, and has also the advantage of being bent or formed into almost any shape.

THE Society of Amateur Photographers of New York has succeeded in leasing centrally located and commodious quarters in the Telephone Building, No. 113 West 38th street, between Broadway and Fifth avenue, and active preparations are in progress toward putting the rooms in order, and the Society is using every effort to secure the best possible accommodations for its members. During the interim, before the new quarters are ready, arrangements have been made for the members to use the former dark rooms of the Society at 122 West 36th street.

A MOVEMENT is on foot, originating at a meeting of the Meteorological Society of Berlin, to take *simultaneous* photographs of flashes of lightning from widely distant points of view, during this summer, with a view to obtaining a more accurate knowledge than now exists as to the length and direction of each flash.

MR. GEORGE L. HOLMES, of the Niagara Camera Club, Lockport, N. Y., is organizing a reunion of the amateur societies of the western section of this State, to be held in Rochester or Buffalo. Those clubs desirous of participating should communicate with Mr. Holmes at once.

[From our Special Correspondent.]

ENGLISH NOTES.

Most people laugh at pin-hole photography, but I think that if they would carefully study the results attained by Mr. George Davison, the Hon. Secretary of the Camera Club, they would see that it gives results which, for softness and ideality, are not to be despised. But an ounce of practice is worth a ton of theory, and I strongly recommend every reader of the BULLETIN to go straightway and make a pin-hole photograph for him or herself. Make a cardboard slide to fit in front of the camera in place of the lens, cut out a square inch in the middle of the card, and paste over the hole a piece of tinfoil (which should itself be examined to see that it is perfectly opaque). Make the point of a sewing needle redhot and push it through the center of the tinfoil. This should leave a perfectly round hole with clear edges, and from the one-thirtieth to the one-fiftieth of an inch in diameter. A strip of cardboard running in front of the tinfoil will act as a cap.

On a bright day the outlines of the principal object may be seen on the focusing screen when the pin-hole is open ; but it is a good plan to select the point of view with a lens and then substitute the pin hole for the lens. Whatever the lens showed on the ground-glass the pin-hole will also depict. As for exposure, this must be learned by experience ; but on an open-air subject with good light five minutes may be given as an experiment, using a rapid plate.

For young people who want to "try to photograph" the pin-hole camera is capital ; as one can be made out of almost any small wooden box, and the

expense is very small. By using a box 66 feet long a picture as sharp as need be desired can be obtained.

The advance in the price of platinum which has taken place during the last few months is a very serious thing for users of that most artistic and permanent of all printing processes—the platinotype. The price of the metal has risen from \$8 to \$13 per ounce. The principal source from which platinum is obtained is the Ural Mountains in Russia, and these can only furnish a limited supply annually. One reason for the advance in price is doubtless the great extent to which the metal is now employed by the makers of electrical apparatus.

But “its an ill wind that blows nobody good,” and the makers of bromide paper are feeling the benefit of the increased price of platinotype material. The kallotype process too, the invention of Dr. Nicol, of Birmingham, stands a better chance of a fair trial.

Mr. John Place, the well-known optician and camera-maker, of 13 Bull street, Birmingham, now keeps a good stock of Anthony's climax films. I have lately been carrying these in my dark-slides instead of glass, and the diminution of weight is most marked. The quality of the emulsion with which these celluloid films are coated is really excellent, and they give me a greater latitude of exposure than I ever enjoyed with glass, together with a marked freedom from halation.

A great deal of nonsense has lately appeared in the English photographic press about exhibitions and awards. We are told that we should be content with the honor of being “hung;” and comparisons with exhibitions of paintings are instituted. But critics forget that although no medals, etc., are awarded at most of the Academy shows, fine art galleries, etc., yet practically every picture is priced; and every “amateur” is only too pleased to sell his paintings, and in fact expects to do so. But what an outcry would be made in the photographic world if such a procedure became common among those who practice the “black art.” We are told already that we are “ruining the professional;” and the theory (which at present has little or no truth in it), right then becomes a fact. I have also a strong feeling that when prizes are offered in any competition they ought as a rule to be awarded.

The popularity of systematic work in photography continues to increase. In the next issue (July) of the *Photographic Quarterly* there will be an article on the subject by the Rev. T. Perkins, and it is becoming generally recognized that there is something better to be done than merely to “play at photographing.” Survey work offers great facilities for usefulness in this direction. Let each worker take a bit of a map and resolve to record in black and white everything that strikes him as worthy of presentation in that corner. Every year his work will increase in value, and his negatives will be prized by generations yet to come. All good work is done with a purpose.

The copy of the “International or Summer Annual of Photography” (Anthonys) for 1890-91, which has just reached me, seems to have only one fault—there is too much for the money! Over a score of illustrations, and hundreds of articles by the best workers in all countries, combine to make a book which in its line has never been approached.

To those who have large negatives which, from an art point of view, are more or less failures, I advise the plan of cutting out a set of apertures in opaque

paper, corresponding each with some smaller size, and placing these in turn over the larger negative (or, better, over a print from it), to see if some portion of it will yield a good composition. Full many an exquisite quarter-plate "bit" blushes unseen in the wide expanse of a 15 x 12! One grand point of printing from a part only of a big negative is that we thereby secure the effect of a very long focus lens on a small plate; and this effect is almost always an improvement.

Those who find toning with gold a troublesome process should try Lionel Clark's platinum toning process. Make a stock solution of 60 grains of chloroplatinite of potassium to 2 fluid ounces of distilled water. To make the toning-bath take:

Stock solution	1 fluid dram.
Nitric acid	3 drops.
Distilled water	8 fluid ounces.

Print *very deeply* on mat-surface paper; wash the prints well and immerse them in turn in the toning-bath. They will change color in a few seconds. When a dark-brown or black tone has been obtained, remove the prints to a dish of cold water containing a little carbonate of soda; this stops all further toning action. Finally, fix in hypo and wash well. It is almost impossible to fail in this method, and the results are very artistic, approximating to platinotype prints.

In this, as in all ordinary fixing processes, the hypo should be kept alkaline. Those who forget to add a teaspoonful of ammonia to every bottle of hypo they prepare, do so at the risk of this powerful agent turning acid and decomposing. With the alkali it keeps all right.

The well-known Liverpool amateur, Mr. Paul Lange, has accepted a commission to visit Iceland in order to obtain a set of lantern slides which, when exhibited, shall induce tourists to visit that barren, icy, volcanic, yet picturesque and health-giving island.

How the new Eastman "rollable" celluloid film smells of amylacetate, one of the solvents employed in dissolving the gun-cotton which is its chief constituent! But in the country the charged roll-holder causes the carrier thereof to be merely accusing of having his pockets full of "pear drops" (the same chemical is employed to flavor this favorite "sweetie"); but in the confined space of the dark room the odor is too strong to be pleasant, at least it is found to be so by

TALBOT ARCHER.

CHEMISTRY OF IRON AND ITS SALTS AND THEIR BEHAVIOR IN PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

(Continued.)

TABLE OF THE COLORED PRECIPITATES FORMED BY POTASSIUM FERROCYANIDE WITH THE SALTS OF THE FOLLOWING METALS:

Zinc, tin, bismuth, lead.....	White.
Cadmium.....	Pale yellow.
Manganese.....	White, then pink.
Ferrous (FeO).....	White, becomes blue in the air.*
Ferric (Fe ₂ O ₃).....	Prussian blue.

* The actions are represented thus:

(1) $K_4(FeCy_6) + 2 FeSO_4 = 2 K_2SO_4 + 3 FeCy_2$.

(2) $9 FeCy_2 + O_3 = Fe_2O_3 + Fe_4(FeCy_6)_3$.

Cobalt.....	Green.
Nickel.....	Apple-green.
Titanium.....	Red brown, soluble in excess.
Titanium, if it contains iron.....	Olive.
Zirconium.....	Canary.
Molybdenum.....	Dark brown.
Chromium.....	Greenish gray.
Uranosum (UO).....	Light brown.
Uranicum (U ₂ O ₂).....	Red brown.
Vanadium.....	Green yellow.
Tantalum.....	Olive.
Cuprosium (Cu ₂ O).....	White.*
Cupricum (CuO).....	Red purple.
Mercury.....	White.†
Silver.....	White becomes blue in the air.‡
Gold (AuCl ₃).....	Emerald green.
Platinum (PtCl ₄).....	Olive.
Palladium.....	Olive.

TABLE OF THE COLORED PRECIPITATES FORMED BY POTASSIUM FERRICYANIDE WITH THE SALTS OF THE FOLLOWING METALS:

Ferrosium (FeO).....	Blue (Turnbull's).
Ferricum (Fe ₂ O ₃).....	No precipitate; the solution turns red brown.§
Cadmium.....	Dark yellow.
Zinc.....	Yellow red.
Manganese.....	Dark gray brown.
Nickel.....	Yellow.
Cobalt.....	Reddish brown.
Tin.....	White.
Titanium.....	Brown yellow.
Bismuth.....	Yellowish brown.
Cupricum (CuO).....	Yellowish brown.
Uranosum (UO).....	Reddish brown.
Mercurousum (Hg ₂ O).....	Brownish red.
Mercuricum (HgO) with the sulphate and nitrate.....	Yellow.
Mercuricum, with the chloride.....	No precipitate.
Silver.....	Red yellow.
Gold.....	Brown.
Platinum.....	Slate blue.

FERROUS FERRICYANIDE Fe₃ (Fe₂Cy₁₂) (Turnbull's Blue.)

Potassium ferricyanide produces with the ferrous salts a blue precipitate finer than Prussian blue, which is known in commerce under the name of Turnbull's blue.

* Oxidizes in the air into purple red cupric ferrocyanide.

† Easily decomposed into mercuric cyanide, soluble, and iron cyanide, which turns blue in the air.

‡ Soluble in aqueous ammonia, potassium cyanide and sodium thiosulphate. Insoluble in ammonium salts. Nitric acid oxidizes it to silver ferrocyanide. Sulphuric acid transforms it into sulphate. Hydrochloric acid and other acids do not act upon it.

§ The ferric salts are easily distinguished from the ferrous by these reactions.

It is converted by heating in the air into Prussian blue and ferric oxide. Treated with potassium hydrate it is decomposed into potassium ferrocyanide and ferroso-ferric hydrate. This distinguishes it from Prussian blue, which in the same action forms ferric hydrate.

Turnbull's and Prussian blue are formed in the cyanotype or blue process of Sir John Herschel (see further on).

FERRIC FERROCYANIDE $\text{Fe}_4 (\text{FeCy}_6)_3$ (*Prussian Blue*).

Prussian blue can be prepared by adding a solution of potassic ferrocyanide to a solution of ferric chloride.

Prussian blue assumes in drying a beautiful and intense blue color with a copperish luster. It is not poisonous; is tasteless, odorless, insoluble in water, alcohol and ether, soluble in oxalic acid and ammonium tartrate. The solution, to which a little gum arabic is added, is sold as writing ink.

The alkalies, aqueous ammonia and the alkaline carbonates transform it into ferric oxide and ferrocyanide, hence as a dye it does not resist the action of soap.

Concentrated sulphuric acid dissolves it without evolving prussic acid, forming a white gelatinous matter, which regenerates it by addition of water.

Hydrochloric and nitric acid decompose it entirely.

Hydrogen sulphide reduces it with formation of ferrocyanide. Zinc, iron, etc., act in the same manner.

Soluble Prussian Blue. Potassic ferric ferrocyanide, $\text{K}_2\text{Fe}_2 (\text{FeCy}_6)_2$.

This compound serves to prepare blue inks. It is obtained by mixing two parts of potassic ferrocyanide with one part of ferric chloride and washing the precipitate with alcohol.

FERROUS SULPHATE FeSO_4 (*Protosulphate of Iron, Green Vitriol, Copperas*).

Ferrous sulphate crystallizes in monoclinic rhomboidal prisms with seven molecules of water. It contains 54.68 per cent. of anhydrous sulphate. The balance is water.

The crystals are greenish-blue when the salt crystallizes in an acid solution, and emerald green if the solution contains ferric sulphate.

Ferrous sulphate is not poisonous. Its taste is styptic, its reaction acid. All the oxidizing agents transform it into ferric sulphate.

It is insoluble in absolute alcohol. Alcohol of 50 degrees dissolves about 3 per cent. of it.

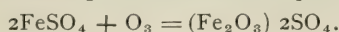
100 parts of water at 50 degrees Fahr. dissolve 61 parts of FeSO_4 .

"	"	59	"	"	70	"	"
"	"	91	"	"	151	"	"

100 parts of FeSO_4 dissolve in 164 parts of water at 50 degrees Fahr.

"	"	"	143	"	"	59	"
"	"	"	87	"	"	75	"
"	"	"	33	"	"	212	"

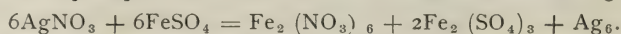
Exposed to the air, the crystals of ferrous sulphate effloresce and become covered with an ochreous coating of basic ferric sulphate:



The oxidation is prevented by crystallizing the salt with a small quantity of sugar, glucose, gum arabic, etc., added to the solution. The oxygen acts then on the organic substance by means of the sulphate, which serves as a medium.

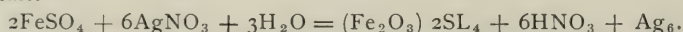
The solution of ferrous sulphate is also oxidized in the air with formation of basic ferric sulphate and normal ferric sulphate, which colours the solution red. The addition of a small quantity of sulphuric acid or of a saccharous substance—sugar—preserves it from this action.

Ferrous iron precipitates to metallic state the salts of silver and gold :



It is this action which gives rise to the formation of the photographic image in the wet collodion process ; the metallic silver, in the nascent state, precipitating with adherence on the parts of the silver bromo-iodide film impressed by light.

According to A. Davanne and Joüet a basic ferric sulphate is formed, which, in precipitating, united to the silver, imparts a yellowish tint to ferrotypes : “The following equation indicates that one equivalent of sulphuric acid should be added to two equivalents of ferrous sulphate. Practically, it may be said that the quantity of acid should be equal to the fourth part of the weight of the ferrous salt:”*



Ferrous sulphate unites with the sulphate of potassium, zinc, nickel, etc., forming double salts.

(To be continued.)

[From Photographisches Wochenblatt.]

THE GREEN DURABLE REDUCER.

BY L. BELITZKI.

LAST year I had occasion to mention the acid reducer ; but now, after having worked with it for over three months, and having discovered its best composition, I am able to give more definite information.

The compound in question is the ferric oxalate of potassium or oxalate of potassium and iron, whose composition, preparation and application for reducing I explained in 1884 in the *German Photographen Zeitung*.

The solution of this handsome green double salt in neutral hyposulphite of soda is much used since that time for the reduction of negatives ; but it has several defects.

Freshly prepared, the reducer is light green to yellow ; sometimes it remains clear for several days ; at other times a continuous decomposition takes place after several hours. It becomes cloudy and deposits a precipitate of basic salts of iron and sulphur. This precipitate would also soil the negative sometimes, and had to be removed by an alum bath mixed with muriatic acid.

But if the ferric oxalate of potassium is dissolved in an acid fixing bath the liquid will remain clear, and it has a yellow red color, which in the beginning is harmless, although, after closer observation and longer application it cannot be considered desirable, as will be seen from the following :

While the ferrous salts are ordinarily green and the ferric ones yellow to brown, it is the reverse in the combinations of iron with oxalic acid. The fresh oxalate of iron developer is red, and consists of ferrous oxalate, dissolved in oxalate of potassium (oxalate of potassium and iron) ; to its extraordinarily great tendency to higher oxidation, therefore to change into ferric oxalate, is due

* Bull. soc. franc. photo., Vol. V, p. 114.

its property as a strong developer. Contrary to this the green ferric oxalate (ferric oxalate of potassium) will give off oxygen under certain circumstances and returns again to the red salts. The solution of the green salt alone does not attack silver, and therefore cannot have a reducing action on negatives; but if hyposulphite of soda is present at the same time the action commences.

This is a very interesting chemical process: the hyposulphite of soda has a great tendency to form with silver the well-known double salt, which results when silver prints are fixed. But as silver as a metal cannot combine with the hyposulphurous acid, the ferric oxalate is forced to give part of its oxygen to the silver, whereby the formation of the hyposulphite of soda and silver salt on the one hand and a reduction of the ferric oxalate to ferrous oxalate on the other hand takes place; thus the green color of the ferric oxalate passes into the red (in dilution yellow), of the ferrous salts. If now the color of the reducer was yellow or red from the beginning, a change of the same by reduction in the color is not perceptible. But it is very agreeable with chemicals if changes of the same can be recognized at once by an alteration of color. Thus we recognize in the organic developer, when the color becomes yellow or brown, the gradual weakening and age of the same; this is the case with iron and many other compounds, so that every other test is unnecessary.

It would therefore be a decided defect of the acid reducer, if it could not be prepared with the handsome green color so peculiar to the ferric oxalate of potassium.

If the acid fixing solution, in which the green iron salt is to be dissolved, is made with acid sulphite of soda (bisulphite of soda), or with neutral sulphite of soda and addition of tartaric, sulphuric or muriatic acid, the ferric oxalate of potassium will dissolve each time with more or less yellow to red color. If oxalic acid is used to liberate the sulphurous acid from the neutral sulphite of soda, the green color of the ferric oxalate salt remains preserved. The best formula for this reducer discovered by me is the following:

Ferric oxalate of potassium.....	10 grams.
Neutral crystallized sulphite soda.....	8 "
Oxalic acid (powdered).....	2½ to 3 "
Fixing soda.....	50 "
Water.....	200 "

In this order the compounds are dissolved, filtered and then kept in the dark, because the ferric oxalate of potassium will decompose in the light and become inactive. If the fixing solution is 1:5 instead of 1:4, 40 grams fixing soda should be taken instead of 50.

If the sulphite of soda is added after dissolving the ferric oxalate of potassium, the green color of the iron solution will change into a blood-red one by formation of ferric sulphite; if everything is dissolved, enough oxalic acid should be added gradually, until the red color of the solution has disappeared and the original green one has been restored. This requires about 2½ grams oxalic acid. The fixing soda, added last, leaves the color of the liquid unchanged. If tartaric acid, sulphuric acid or muriatic acid is taken to acidify the liquid, which became red by the addition of the sulphite of soda, the green color will also return, but it gives place at once to a yellow one, if the hyposulphite of soda is dissolved in the same. I have succeeded in preserving the green color by oxalic acid. By shaking with silver powder the green reducer becomes at

once yellow, the ferric oxalate by delivering oxygen to the silver being reduced to ferrous oxalate.

This green acid reducer offers the following advantages in opposition to the neutral or the mixture of the fixing soda with acid prussiate of potassium, which will not keep one hour :

First.—The liquid remains green and clear and leaves no sediment in a corked bottle, even after months.

Second.—It will also keep well in an open dish, so that no anxiety may be felt about immediate refiltering after use. If left a day in an open dish, the solution is decomposed by oxidizing and evaporation of the sulphurous acids, becoming yellow, sulphur separating.

Third.—The color is a sure means for judging its utility and strength. When becoming reduced the green changes to a yellow, which becomes gradually darker.

Fourth.—The reducer can be used for a long while, because the oxygen of the oxide of iron salt, absorbed by the silver during use, is replenished again from the air, as comparative tests in atmospheric air and carbonic acid gas has demonstrated.

Fifth.—No yellow deposit will accumulate on the negative during use.

Sixth.—On account of its equal proportions of hyposulphite of soda with the fixing solution, this reducer can be applied with advantage at once after fixing for the whole negative or only parts thereof, and no streaks or visible edges will form.

Seventh.—It is applicable for every development, while, if developed with iron the red prussiate of potassium reducer will oftener color the whole film blue soon after fixing.

Eighth.—The gelatine film is tanned by the acid reducer, therefore retains less liquid; the after action of the same is therefore much less than with the neutral, so that the degree of reduction can be regulated much easier than before.

On the strength of the foregoing I can therefore recommend the green acid reducer highly as an essential improvement.

[From the *British Journal of Photography*.]

THE ART OF RETOUCHING.

BY REDMOND BARRETT.

CHAPTER III.—MATERIALS AND THEIR SELECTION.

THE efforts of the early retouchers were indeed primitive, both as regards the quality of their work as well as the manner of their accomplishing it. To hold the negative against the window, and so struggle on in pursuit of the artistic was an incident of every-day occurrence. Nowadays all that is altered; we live in better times. The retoucher not only has a special desk, but every other comfort to hand to help him through his day's troubles.

The requirements necessary for retouching are not numerous, and may be briefly enumerated as follows: A retouching desk or frame; a supply of pencils of various grades; in some cases a magnifying glass, but this latter should be used very sparingly; some small brushes; some stumps, both paper and leather;

a few cakes of water color—namely, black, violet, carmine, and burnt sienna. A bottle of good, hard mat varnish (one which dries quickly with an even surface, and upon which work may be done with either stump or pencil) is not an absolute necessity, but it is a very valuable adjunct to his stock-in-trade. A small quantity of glass paper, with the finest tooth for sharpening the leads; Oakey's No. 0 I have found highly satisfactory. It is useful at times to have a very sharp knife for the purpose of cutting out any imperfections that may happen to be in the films of the negatives, or to carry out alterations that cannot be carried out by the aid of pencil and brush. Though last, not least, a bottle of medium, which will, I think, complete our list of materials. Of course, when we use the ever-pointed pencils we must have a stock of leads for refilling.

We will take the pencils first. In the selection of pencils and leads the intending retoucher should spare no pains, as it is exceedingly difficult to procure leads of a uniform quality, so few makers produce them really good. Those used for retouching should be of the finest and closest manufacture, well moulded and absolutely free from grit. Prejudice in these matters has much to do. For many years I used no other pencils but "Faber's," but some years back I was induced to try Hardtmuth's, and I was so pleased with them I discarded the former, and have used only Hardtmuth's since. I have always found them reliable, and I do not believe there are better pencils in existence for retouching than those they produce. If I thought there were I would adopt them. Nothing is so grateful to a hard-working retoucher as a good pencil, one with which he can make a firm, velvety touch, and which leaves a satisfactory deposit on the film. For these qualities you cannot select better, as far as I have experienced, than Hardtmuth's pencils. I do not wish to infer that the other makers are inferior (I only give a personal preference), for there are so many really good makers in the field that it would be a more difficult matter for me to decide upon their relative merits than I would care to undertake.

It is a disputed point among professional retouchers as to the fittest grades for general use. Some contend that HHH, or even HHHH, will be found the most suitable; others would not use them, preferring a much softer grade. I have used both, and must say I prefer the softer grade. I think a HB a good medium quality, but am always open to use a harder, such as F, or even H; or a softer, such as B. This point should be greatly influenced by the quality of the negative under treatment. It is not at all advisable to restrict the choice of pencils to either extreme, but having three or four grades always by you, use whichever in your judgment may seem the best suited to the negative you are about to retouch.

Having procured your pencils the next thing is to put a point on them, and this is done by rubbing the exposed lead upon the fine glass paper until we have secured the desired sharpness. I do not recommend the use of the ordinary pencils, but rather those known as the "ever-pointed." These are pencil cases, as it were, which can be refilled any number of times with fresh leads; they are comfortable to use, and the economy, compared with the ordinary pencils, is simply enormous. They possess the great advantage of always being the same length, and as you can use the leads to the very end they are necessarily not so expensive. In a word, one holder will last for years, and the leads, bought in boxes of half-a-dozen, can be changed whenever needed, and without waste. Perry's ink pencils, too, will be found useful at times when the ordinary ones

fail to produce the proper density. They will be found very useful when unpleasant markings in draperies and costumes have to be obliterated. In many cases an otherwise good picture may be rendered useless by the fact of a few nasty plaits showing across the figure, and which should therefore be taken away. This the ordinary leads often fail to accomplish, but by the use of the ink pencil success is gained.

As regards the magnifying glass I will say but little, as I am not an advocate of its use from a general point of view. There are many cases where its use is most desirable, but certainly not as a general help to the retoucher in his day's work. The injudicious use of the magnifying glass is sure to impair, if not more seriously damage, the eyesight of the one who contracts the habit of its daily use. Have it by all means—but use it seldom.

There are many forms of desks in use for retouching, but I really think the simpler they are the better. Those most generally employed are fitted with carriers or frames to hold the various sizes of plates used in photography. The desk itself may be described as consisting of three frames hinged together (on the principle of a folding screen), and a mirror fitted into the lowest frame to reflect light. The carriers are fitted into the middle frame, and the upper one is made solid so as not to allow any light to reach the retoucher's eyes. The middle and upper frames are supported in position by means of metal struts, which fit into notches at the lower ends, the struts in turn fitting into grooves which allow the desk to be closed when out of use.

A more compact form is also used answering the same purpose, in which the carriers are replaced by a sheet of plain glass, and which will permit of all the different sizes of negatives being worked up without the bother of removing the carriers. This sheet of glass should be covered with a piece of brown or black paper (the latter for preference), which will exclude the light, as a superabundance of same is calculated to fatigue, if not absolutely injure, the eyesight. In this paper a space should be cut large enough to allow of any ordinary size head being retouched, and which would thus render it serviceable, no matter what size the plate might be. To the amateur the question of shutting out the light is of little moment, nor is it of great importance to the professional who may only retouch a few negatives daily, but to the retoucher who is seated at his desk all day long, hard at it, and who well knows that not even the best eyesight can hope to retain its vigor after a few years of constant employment at this occupation, it becomes one of vital importance. Personally, I prefer a sheet of white paper for a reflector instead of the mirror, and generally place same over it. It reflects an even, mat light, which is just what we want; and even if the sun shine directly upon it there is not that glare which is a natural consequence from the use of the mirror, and which is impossible for work.

The light by which negatives should be worked must necessarily be a good one. By this must not be understood a very powerful or a glaring light, but just enough to thoroughly show up all the defects in the negative. There have been some very elaborate desks offered to the public and the professional from time to time, but they have never come into general use. A few amateurs may patronize them, but the professional retoucher invariably gives them the "cold shoulder." The fact is, there is no necessity for a complicated machine; the simpler it is the better. A very good all-round desk may be found at Wratten & Wainwright's; it is very simple, and thoroughly suits its purpose.

A bottle of "medium" is indispensable. By rubbing a little of it with cotton wool on the parts to be retouched we secure a tooth, without which it would be impossible to work.

This operation may appear a very easy and simple matter, but it will be found to demand a certain amount of care in order to accomplish it successfully. We must not deposit too much fluid on the negative, or we may cause the surface to become somewhat greasy as it were, and anything but comfortable for working upon. But, bad as this is, it is not the only trouble, for a too plentiful deposit of the medium renders the danger of the removal of the work during the process of varnishing almost a certainty. No; we must try to put on a small quantity, and rub it so that it may leave a nice dry surface behind and yet cover all the film evenly upon which we intend to work. By this means we minimize the chances of our coming to grief in varnishing, to say nothing of the pleasure we will have while working.

In the good old wet-plate days medium was not required, the negatives were what is termed gummed, a process which gave sufficient strength and tooth to the surface so as to allow of working up delicately with a pencil or brush; nowadays we have a tougher surface for working upon. The dry plate has often a very hard and tough film, which may be worked upon with vigor and thoroughly without fear of injuring it. When the medium has been properly applied (granted one understands what he is doing), there is no limit to the freedom of touch with which we may carry out our retouching. I am a great advocate of freedom of touch, and I have not the least hesitation in declaring that a crippled touch, such as is suggested by the so-called touch resembling the letter S, is as fatal to artistic effect in practice as it is stupid in theory. The success of our touch, as well as the speed with which we carry out our work, depends very considerably upon the manner of our rubbing the medium on the negative, or else I would not make these remarks thus early. In damp weather be sure that the film be perfectly dry before applying the medium, otherwise you will have anything but a pleasant surface for working upon.

We next come to the stumps. The judicious use of the stump can be made a great help to ordinary or defective negatives. Suppose a lady with a white dress has a rather inferior negative taken, with little, if any, detail in it—it may be a mass of half tone or else a patch of white. Here the stump will help us in gaining a very useful effect. With the stump, charged with lead, we can put in many of the details and broader high lights (impossible to produce with the pencil or brush), and so succeed in making a very passable photograph from a defective negative. This will be observable in such negatives as those of ladies in court dress or evening dress, or any other class of picture where white predominates. It is very seldom in such negatives that we find sufficient detail—the dress being often a vast patch of white or else a mass of half tone, as I said before. Now to attempt to work in the necessary detail with brush or pencil would be madness, whereas a touch of the stump will work like magic; we can also work in effects and modify shadows by stumping on the reverse side of the negative, having previously mat-varnished it or strained white tissue paper over it, such giving us a suitable ground upon which to carry out the work. Indeed, we can effect modifications in this way that would be recklessness to attempt with the pencil on the film side.

The use of the knife requires considerably more skill and delicacy of touch

than does the stump, or even the pencil. The results are more forcible, and the danger of spoiling a negative very great. By this means a figure may be entirely cut out of a picture so skillfully that a moderately sharp eye would fail to notice the fact. Ladies' waists, too, can be cut away, and what might have been an ungainly figure made neat and presentable. Backgrounds also can be cut away and altered to almost any degree. In fact, it is very useful to acquire a mastery over the use of the knife. Be not too anxious to use it, but when occasion demands that you should, do so skillfully. Many cases arise where a nasty angle in a dress must be taken away, or else the beauty of an otherwise successful picture will be spoiled. If it were a black or dark-colored dress we could carry out this operation with the pencil and brush; but where the dress be white the knife is necessary. If, however, this objectionable angle can be taken out in the print by the spotter, by all means let it be done, but often it is impossible to do this in such a manner as not to attract the eye, and under this latter condition we (retouchers) are supposed to accomplish the task. For this purpose we must keep our knife or lancet thoroughly sharp and in perfect condition. It must cut, not scrape as it were, and must be handled lightly, in order to avoid any chance of injuring the film. When we have taken away what we think sufficient, we can put a little more medium on the abraded parts, and with the pencil or brush rectify any little defect that may exist after our surgical operation.

Brushes and colors are used in the spotting of the negatives or the taking out of very intense shadows. Color also may be put upon the reverse side of the negative to lighten generally some offensive shadow. Color can also be used, with care, upon the film itself. The opinions regarding brushes vary. I give my vote for the best. They are the cheapest in the end. The saving of time will soon repay the difference in cost, and the pleasure of working with good tools is beyond doubt. I should suggest having them medium size, but with fine points. For spotting, the quality of the colors matters but little, but for the difference in price I would advise the best, especially wherever used on the film side of the negative. After very many years of experience, I can confidently say you cannot do better than trust to Winsor & Newton to provide you with this portion of your kit. They are always reliable, and for brushes and color I have never been able to find anything better in the market.

Provided with the above materials, we have every means at our disposal to carry out successfully the retouching of any negative that may fall to our lot.

Of all these materials the one upon which we depend most is the medium. Since the introduction of the dry plate there has been, and is still, a want for a really good medium, one upon which a retoucher can get his pencils to take freely, and that will not let the varnishing reduce, to any appreciable extent, the quality of the work. Nearly every photographer nowadays has his negatives retouched before varnishing, and it is very hard indeed upon the retoucher when (in the varnishing) the best part of his work comes away, or is so materially reduced in power as to necessitate the working up afresh of the negative, this time, too, upon the varnish. There is no doubt a medium will be found that will not dissolve by contact with the varnish, and, as a consequence, to a greater or less extent affect the retouching. It is a most disagreeable task to go over a negative a second time. I have a very good medium which I use myself, but I feel sure a better still will be found. This matter of the medium in its appli-

cation to the present plates affects to no small extent a day's work. There is little doubt that a good day's work now is not much more than half what it was in the good old times of the wet plates, but this is no fault of the retoucher, but the conditions under which he is obliged to work.

PHOTOGRAPHIC LENSES.

BY THOMAS R. DALLMEYER.

II.—THE BEST SELECTION OF CURVES ASCRIBED TO THE MATERIAL.

In photographic lenses the curves ascribed to the lenses are spherical, and this form of curve gives rise to what is known as spherical aberration or error, and its effects in single (uncombined or uncorrected) lenses are (a) indistinctness of the image formed for the axial pencil, (b) curvature of field, (c) astigmatism, (d) distortion. A perfect photographic lens would be corrected for all these errors; the corrections are approximated by combinations of lenses, and we will proceed to examine the conditions best suited to accomplish each.

(a) We have seen that no single lens can be made free from chromatic aberration, nor can it be free from spherical aberration. For a given material of definite refractive index the transversal and longitudinal measurements of the aberration vary with the shape of the lens, and, again, the spherical aberration varies with the aperture and the index of refraction of the glass.

For convenience in arriving at accurate results, it is best to separate the smaller errors, shown by a second approximation, from the main or first approximation. Thus, to arrive at a first approximation, we have the well-known formula connecting the radii and refractive index of the material with the focal length:—

$$\frac{1}{f} = (\mu - 1) \left\{ \frac{1}{r} + \frac{1}{s} \right\}$$

Then, in a second approximation, we have two additional corrections to consider, viz., the thickness of the lens and the measure of aberration, t being the thickness, and y the semi-aperture—

$$\frac{1}{f} = (\mu - 1) \left\{ \frac{1}{r} + \frac{1}{s} \right\} - \frac{(\mu - 1)^2}{\mu} \frac{f t^2}{r^2} - \frac{\mu - 1}{2 \mu^2} \left\{ \frac{1}{r^3} + \left(\frac{1}{s} + \frac{\mu + 1}{f} \right) \left(\frac{1}{s} + \frac{1}{f} \right)^2 \right\} \frac{y^2}{f^3} \dots (2)$$

the negative lines indicating a diminution of the first approximate value.

The third term cannot be made nothing for any known material, but it is interesting to make this quantity a minimum with definite media of different refractive indices. In most text-books this is done for glass of the nominal refractive index $v = 1.5$. Taking definite focal length and aperture for parallel rays, we have to decide what values to ascribe to the radii r and s , to satisfy the condition.

Calling the reciprocals of the focal length and the radii F , R and S , we have

$$R = -S + \frac{F}{\mu - 1},$$

and using this notation,

$$R^3 + [S + (\mu + 1) F] (S + F)^2 = \text{minimum.}$$

Differentiating, and substituting

$$-1 \text{ for } \frac{dR}{dS},$$

$$-3R^3 + 2[S + (\mu + 1)F](S + F) + (S + F)^2 = 0$$

and substituting again

$$-S + \frac{F}{\mu - 1} \text{ for } R$$

we get

$$\left\{ \frac{6}{\mu + 1} + 2\mu + 6 \right\} S = \left\{ \frac{3}{(\mu - 1)^2} - 2\mu - 3 \right\} F$$

here if $\mu = 1.5$, $21S = 6F$, and hence

$$\frac{1}{s} = \frac{2}{7f} \frac{1}{r} = \frac{12}{7f} \text{ or } r : s :: 11 : 6;$$

commonly known as the crossed lens.

Supposing the refractive index were higher, say 1.6, here $r : s :: 1 : 15$ to satisfy the above condition, and the lens assumes a shape nearer the convexo-plane lens.

For a given class of known index of refraction, and assuming various ratios between the radii of curvatures, we can from equation (2) find at once expressions that show the amount of aberration in any chosen form. In speaking of lenses it is essential that the term used to describe the lens should define the surface on which the pencil of rays is incident; thus, a plano-convex lens means that the rays are incident upon the plane side, and a convexo-plane lens that the rays are incident upon the convex side.

Now, taking the usual table thus calculated for ordinary forms of single lenses (for parallel rays), in which the refractive index $\mu = 1.5$, and including the correction for thickness, let us see what we can learn here.

	Distance of least circle of aberration from approximate focus.	Diameter of least circle of aberration.
Plano-convex lens.....	$\frac{27}{8} \frac{y^2}{f}$	$\frac{9}{4} \frac{y^3}{f^2}$
Equi-convex lens.....	$\frac{1}{6}t + \frac{5}{4} \frac{y^2}{f}$	$\frac{5}{5} \frac{y^3}{f^2}$
Convexo-plane lens.....	$\frac{2}{3}t + \frac{7}{8} \frac{y^2}{f}$	$\frac{7}{12} \frac{y^3}{f^2}$
Crossed lens.....	$\frac{24}{29}t + \frac{45}{56} \frac{y^2}{f}$	$\frac{15}{28} \frac{y^3}{f^2}$

We see that in each change of form the position and diameter of the least circle of aberration differs; the longitudinal aberration increases or diminishes as the square of the diameter of the aperture, and inversely as the focal length, and the least circle of aberration is proportional to the cube of the aperture, and inversely as the square of the focal length. Thus, for two similar lenses, in radii and glass, but one having twice the diameter of the other, the larger lens will have a longitudinal aberration four times as great, and the least circle of aberration will be eight times as great; and again, of two lenses of the same aperture, but one double the focal length of the other, the longitudinal aberration will be the half (or inversely as the focus), and the diameter of the least circle of aberration the quarter (or inversely as the square of the focus).

Thus, to diminish aberration in a single lens, the only remedy is to stop it down, but this can never entirely cure it. Now, with a given material we have

for a definite focal length the best form to ascribe to the lens to reduce the aberration of the central or axial pencil to a minimum, and we can further improve by stopping the lens down. For photographic purposes we have now to consider the best form to ascribe to this lens to fulfill the other conditions that are also required for the formation of a distinct image. These investigations with a single lens are fully dealt with in Sir G. Airy's paper, "On the Spherical Aberration of Lenses," and for a fuller investigation I must refer you. The steps necessary are (1) to find proportion of the tangents of the angles made by the axis of a pencil with the axis of a lens before and after refraction; (2) the distance from the lens of the plane perpendicular to the axis of the lens at which the convergence of the rays, in a perpendicular or vertical plane, takes place; and (3) the distance from the lens of the plane perpendicular to the axis, and in a horizontal plane at which the convergence of the rays takes place. The difference of the positions of these planes of the primary and secondary foci gives rise to the effect of astigmatism. A geometrical illustration will probably explain the matter more clearly, and I think you will find these preliminary investigations of considerable use in the more complicated ones of combinations and systems of lenses to be dealt with later.

The effect of astigmatism in lenses appears to be little understood, so I offer you the following practical interpretation of the theoretical deductions above referred to in connection with Sir George Airy's admirable analytical treatise.

It has been frequently asked what coma and astigmatism are. Coma is astigmatism, the vertical focal plane being corrected pretty accurately throughout the plane of the image, but the horizontal focal points being situated, off the axis, in very widely-different planes.

Take the plano-convex lens and the convexo-plane lens with a plate having a narrow slit cut across it in conjunction with the lens.

Now, in either case the vertical plane of the axis will have a certain curvature of the field, but the image for the oblique pencils will be distinct (in a sense). Now, if the plate be turned so as to take the horizontal focal plane at positions where the image was distinct for the vertical focal plane, it is no longer so for the horizontal plane, but a very strong coma is visible; with the plano-convex lens coma-out, and with the convexo-plane coma-in. Now, the vertical plane has less curvature of field than the horizontal, so that by cutting off the horizontal and using the vertical, coma ceases.

I may mention here that if astigmatism in a single combination or any system of lenses were entirely cured, there should be the same focus for both planes.

In testing lenses for astigmatism, this is a very powerful method of finding the amount. The effects of observing a point of light are very interesting, as is also the use, in double combinations, of an astigmatic stop.

(To be continued.)

THE DAMP COLLODION PROCESS.

BY P. C. DUCHOCHOIS.

LATELY the *Photographic News* called the attention of photographers, and of the amateurs who press the button and do the rest, to the damp collodion process, a very old and very good and useful one indeed, giving as a preservative of moisture a compound consisting of silver nitrate, honey and glycerine, which

the editor of the *News* attributes to Mr. Fysh, one of Mr. Valentine Blanchard's friends, but which is also attributed to Mr. W. H. Harrison, and was published in the *Year Book* for 1863.

Honey as a preservative of moisture was, however, introduced by Mr. Shadbolt in the early days of the collodion process. It is described in "Hardwick's Manual of Photographic Chemistry" of 1855, and glycerine recommended in 1861 by the late Thomas Sutton for the same purpose.

Damp collodion plates, prepared in the manner in question, that is, by a preservative of moisture containing honey, do not keep well for more than a few hours in hot weather, work intense, and are liable to red solarization, owing to the reducing action of the glucose, which is one of the constituents of honey. To avoid this, probably Sutton substituted gum arabic for honey, and the plate could be kept, then, in good condition for a day and more.

The formula given by Mr. Fysh stands thus :

Old best crystallized honey.....	4 ounces.
Price's glycerine.....	2 "
Silver bath, 30 grains strong.....	6 "

When mixed, half an ounce of kaolin is added, the whole occasionally shaken for an hour, then exposed to diffused light for two days. The solution improves by keeping. For use, some of the supernatant liquid is decanted, then filtered and flowed on the sensitized plate until the oily appearance is removed. The addition of acetic acid to the preservative, as advised by Mr. Harrison, is a necessary improvement ; the plates keep better.

The following is the compound recommended by Thomas Sutton :

Silver nitrate.....	20 grains.
Gum arabic.....	25 "
Glycerine, c. p.....	160 "
Acetic acid.....	5 minims.
Water.....	1 ounce.

A process quite reliable—which is, in fact, the first one ever published to preserve the sensitiveness of collodion films for a certain period—is due to Messrs. Crookes and Spiller. The preservative contains no organic substance, and consequently nothing which by acting on silver nitrate either in the light or in the dark can give rise to the reduction of the same. The plates keep well, therefore, for a week, and even a longer period, in the cold season, according to Messrs. Crookes and Spiller, and their sensitiveness is not much impaired, if at all, and the development can be delayed for a day or two, but it is best, however, to develop the day the plates are exposed.

We have used this process extensively when traveling in the years 1856–57 to take stereoscopic views, preparing the plates in the evening to expose them the next day or the day following, and we seldom met with a failure. Since we have often recourse to it, in order to avoid surface markings, pin-holes and other defects, resulting from the drying of the film in the hot days of summer, the exposure should be lengthened for several minutes.

The preservative is made according to the following formula, and kept in the light when not in use :

Magnesium nitrate, dry.....	160 grains.
Silver nitrate.....	5 to 10 "
Glacial acetic acid, c. p.....	3 to 5 minims.
Distilled water.....	1 ounce.

The magnesium nitrate should be dissolved first, and if the solution shows an alkaline reaction to test-paper, it should be just neutralized by nitric acid in order to avoid the formation of silver acetate.

The plates prepared in the usual manner with a bromo-iodized collodion are drained for an instant on blotting paper on their removal from the silver bath, then immersed in the preservative for about three minutes, then placed on one angle upon blotting paper till the superficial liquid is drained off, when they are stored for future use or placed in the holder after wiping the back clean.

As said above, the exposure is nearly the same as for wet plates. The development is effected by pyrogallol or ferrous sulphate. The former requires lengthened exposure to about three times longer, the latter is consequently preferable, moreover, better details in the shadows and in the lights are obtained. Before developing, the plates should be immersed for a moment in the original silver bath. In our practice we use a separate solution 20 grains strong, rocking the tray several times to wash out the preservative, so that the developer flows and acts evenly.

Ferrous sulphate.....	30 grains.
White sugar.....	60 “
Acetic acid, No. 8.....	40 minims.
Sulphuric acid.....	2 drops.
Water.....	1 ounce.

[From the Photographic News.]

A MEETING ABOUT LENS STANDARDS.

(Continued.)

Mr. T. R. DALLMEYER did not think that any optician individually would go to the unnecessary expense of altering the whole of his system. He thought that any standard adopted should be universal, and not confined to England alone. The French Photographic Conference had done well to invite persons from other countries to meet and discuss this question of lens standards, for diaphragm apertures are not wanted only for England, but for every country. He had first suggested the decimal system for lens apertures, and the decimal standard seemed to have been taken up by the French; indeed, he thought that it would be taken up universally. The Conference did not take up exactly his standard, but Dr. C. Fabre, who was a great authority, considered his (Mr. Dallmeyer's) standard to be better than that adopted by the French. Had he been at the meeting he should have suggested the ratio for apertures of one over the root of ten, instead of one over ten. The tendency of the times at home and abroad is toward the decimal system, and he thought that that system should be employed for lens stops. He thought that a bayonet gauge would be convenient and valuable, but that they should have a screw bayonet catch, and not a pin bayonet catch. He also thought that they should follow up what had been done by Continental scientific men, and that a system based upon the English fitch would not be likely to become universal.

Mr. W. E. Debenham hoped that the Committee had had the French report, from which it appeared that the English Society's standard had never been mentioned at the Paris Conference. That Conference had considered and rejected Mr. Dallmeyer's standard of f over ten, but had adopted the decimal standard. Lens mounts made according to the standard f over four of the Photographic

Society are now largely made and sold, so the fact should have been brought under the notice of the Conference. He did not see why a good and exceedingly convenient standard, once made and adopted, should be thrown aside without very strong reasons. Very likely the decisions at the last International Conference might be thrown aside when the Conference meets at Brussels.

Mr. Dallmeyer said that one over the root of ten was "the" decimal standard, and that one over ten was "a" decimal standard.

Mr. Arthur Rayment was then invited to speak by the Chairman, and replied that he came to listen, and not to talk.

Mr. T. P. Watson said the same.

The Chairman then read the following letters :

DEAR SIR,—We as manufacturers and dealers, find that the standard flanges $1\frac{1}{2}$, 2, $2\frac{1}{2}$, etc., with the Whitworth threads, are generally approved of, and almost the first question buyers put now is : "Are these standards?"

CHARLES REYNOLDS & Co.,

72 and 73 Fore street, London, E. C., April 25th.

DEAR SIR,—I regret very much that a very important engagement, of which I was unaware when you honored me with a call, will not allow me to attend the discussion this evening.

If I had been able to attend, the points I should have pressed would have been these :

1. That all flanges should be made in progressive sizes of $\frac{1}{4}$ inches, as 1, $1\frac{1}{4}$, $1\frac{1}{2}$, and so on.

2. That a universal pitch of thread be used for flanges having an aperture up to $2\frac{1}{2}$ inches, viz., a pitch of 18 threads per inch.

My reasons for the above propositions are :

In regard to No. 1.—That as many makers have issued a large number of lenses having flanges of varying apertures, and threads of varying pitches, it would become quite easy for any maker to manufacture adapters that would screw on to all existing lens mounts, so as to make them fit a standard flange.

In regard to No. 2.—The screw pitch I have chosen is technically known as $\frac{5}{16}$ Whitworth, or $\frac{3}{4}$ gas. The screw chasers for working these threads can be obtained at almost any decent tool shop, and, being a Whitworth pitch, is almost universally used. The depth of the thread being only $\frac{1}{32}$ of an inch, it also admits of fairly light flanges being used without the danger of the bottom of the threads being cut right through the body of the flange.

Again regretting my inability to attend, I am yours truly,

DAVID W. NOAKES,

Billingsgate street, Greenwich, London, S. E., April 24, 1890.

Mr. Conrad Beck thought the questions before the Committee to depend largely upon an arrangement between manufacturers. Could they, by meeting, arrange any system mutually satisfactory? In the matter of aperture dimensions he did not think that they should agree. As regarded lens-screws, he did not think that so much accuracy as in microscopic apparatus was necessary, especially with the majority of cameras at present in use. The great difficulty in the way of adopting standard flanges is, that at present there are a great number of flanges in the market which they would still have to make lenses to fit after new flanges have been adopted. In any new system the flanges now employed should be utilized as much as possible, rather than that fresh ones should be stamped; therefore it seemed desirable to ascertain what flanges are now mostly in use. After a time the tendency would be for the public to come gradually to the standard sizes.

Mr. William Bedford remarked that before the Photographic Society framed its system of standard apertures, the late Mr. Dallmeyer had a standard system of his own ; but when the Committee of the Photographic Society met it obtained little assistance from professional opticians, who were not represented as they should have been. The Committee fixed on the standard of f over four. He thought that too much might be made of the decimal system, because when the sizes of stops are once fixed the practical photographer does not want to know what their dimensions are ; indeed, the change to f over the root of ten would be of no value whatever to the professional photographer. As regarded flanges, the Committee of the Photographic Society did not consist of first-rate mechanics, but it satisfied itself what the diameters should be. He agreed with Mr. Taylor, that this part of its report might be improved by additional definitions. If the Convention had standards made, opticians, perhaps, would have no difficulty in getting similar standards made by the same firm. He believed that Mr. Dallmeyer would find that this system has come too late, because the system recommended by the Photographic Society has spread, not alone in this country, but throughout America and largely in Continental Europe.

Mr. Dallmeyer thought that in selling lenses it would be well to state the intensity ratio every stop represents ; such information ought to be conveyed.

Mr. F. A. Bridge remarked that stops were not always made accurately.

Mr. Taylor said that some opticians took into consideration the fact that the light is condensed by the front lens of a doublet. He had not suggested that lens screws should be accurate to $\frac{1}{10000}$ part of an inch, but that the standard gauges should be so made.

Mr. Beck said that if the committee would decide upon the sizes, the matter of making the lenses interchangeable might be left to opticians, because the Whitworth standards in ordinary use are available.

Mr. A. Cowan stated that when Whitworth made the standard gauges for the Photographic Society, it was understood that he was also ready to make them at any time for opticians.

Mr. Dallmeyer then moved the following resolution:

"That this meeting recommends that a meeting be called of as influential a body as possible of manufacturing opticians, to decide upon the most convenient series of sizes for standard flanges and camera screws that shall be most suited to meet existing conditions of their manufacture. These standard flanges at present to be limited in number, and, when decided, to report to the Committee of the Photographic Convention of the United Kingdom. It is also suggested that the question of means for their adoption be decided upon. That this meeting be called for the 9th of May, at this hotel, at seven o'clock."

Mr. Conrad Beck seconded the motion.

The Chairman remarked that the question of standard diaphragms was of much less interest to photographers than that of standard flanges. He should be glad if opticians would bring their lenses and compare dimensions.

Mr. Conrad Beck thought that all the lens makers in this country might be invited to state on what system they graduated their stops.

Mr. Dallmeyer's motion was then carried unanimously.

The Chairman then successively took the votes of the meeting as to whether it preferred for lens apertures the ratio of f over the root of ten, f over ten or f over four, and those present voted almost unanimously in favor of f over four.

The meeting was then adjourned for a fortnight.

Last Tuesday the Chairman of the Committee sent the following circular letter, on behalf of the Committee of the Convention, to a number of opticians :

"DEAR SIR,—I am directed to forward to you the inclosed resolution passed at a meeting held on the 25th inst. at the Mona Hotel, Henrietta street, Covent Garden, and to solicit your co-operation. The next meeting will consist almost exclusively of opticians, and, in order to facilitate matters, it is desirable that you should bring details of internal diameters of flanges, number of threads to the inch, and any other details you can furnish in connection with the attachment of all classes of photographic lenses to cameras as now issued by your firm.

"A. HADSON, *Chairman of the Lens Standard Committee.*

"Royal Naval College, Greenwich, S. E., April 29, 1890."

[From *The Practical Photographer.*]

FIRE INSURANCE FOR PHOTOGRAPHERS.

(Continued.)

POSSIBLY the high-rate offices would cast doubts upon the stability of those who consider the interests of photographers sufficiently to accept their risks at a reasonable rate; but, of course, an insurer would satisfy himself as to the soundness of the office before taking out a policy.

We believe that the offices that charge photographers' risks at a specially high rate, do so from an ignorance of the character of a photographer's business and materials in the present dry-plate age. If they have any real reason on their side, we shall be glad to make it known, with a view to the remedying of the conditions which give rise to the extra charge.

From our English correspondents we gather that in many cases, after paying for years the old rates of the old collodion days, rates of 8s. 6d., 10s. 6d., 12s. 6d., or even more, per £100; and after applying in vain to the company with whom they were insured for a reduction, an application to the agents of one or two competing companies has secured much more favorable terms.

As regards the letters from the insurance companies, most of them are entirely useless, simply saying that "the rates are as low as the hazard attaching to the risks will admit," or something equally vague.

One of the companies, which does not wish to be mentioned by name, sends the following :

There has been no wish on our part to evade a reply to your previous queries, as you seem to assume, but the difficulty is to answer them in the form you require, in consequence of the difference there is in photographers' risks. I, however, give you our rates for what we should consider to be a first-class risk of the sort, though you must please to understand that they are merely for your guidance, and not for publication, as we have no wish to make our terms known to our competitors :

If the main building be brick or stone, built and tiled or slated (except the operating house) and solely in the occupation of the insured, there being no stove or high-pressure hot-water apparatus used, and the dry-plate system of photography be exclusively employed—

Building of house, furniture and fixtures therein.....	2/6 per cent.
Stock and utensils therein.....	4/6
Building and contents of operating room or house.....	4/6

If the warranty as to the dry plate system be not inserted in the policy, an additional 2/- per cent. would be charged on the above rates, and if a stove be used, an additional 1/- per cent. in like manner.

A high-pressure hot-water apparatus would not be allowed on any terms.

We presume there is no objection to the publication of the rates so long as we do not mention the name of the office in connection with them, and we cannot see why the name should be withheld since the insurance companies all know pretty well what their neighbors are doing, and nominally work upon the same

table as a basis. The Lancashire Insurance Company appear to reckon 5s. per cent. as an average rate for first-class risks; the County Fire Office quotes, "for building and furniture, 2s. 6d., and for the stock, 4s. 6d. per cent.;" the London and Provincial quote roughly from 2s. 6d. to 5s. per cent., and others about the same. One of the letters from the insurers gives the rates of the Guardian and the Norwich Union, two excellent companies, but it also shows that they do not lower the rates from the old standard until asked to do so. We give the letter:

Finding that we were paying a "hazardous" rate, we raised the question, and got the inspecting managers of several companies to view our premises, so as to show them that this risk no longer existed, with the result that two of them, the Norwich and the Guardian, admitted that our contention was well-founded; and we now pay to the Guardian, for the studio itself, at the rate of 3s. 6d. per £100, and on dwelling-house and shop, 1s. 6d. per £100, instead of 5s. 6d. per £100 on the whole, which we were previously charged. One or two of the other companies offered to make a small reduction, but the two named above put us on the terms stated, and we therefore feel desirous to make the fact known, so that others may benefit in like manner, as well as that the companies mentioned may gain increased business through their liberality and fairness to us.

We are, sir, yours faithfully,

C. W. SMARTT & SON.

Some of our correspondents seem to expect the insurance companies to make a fixed rate for all photographers' risks, and think that this is what we desire to bring about. But such a rate would be as unfair as it is impossible, as we shall show, and all that we can hope is that the companies will take each case on its own merits and cease to charge a photographer an extra rate because he is a photographer. After settling a general rate for the best risks, which we think should be very little higher than the dwelling-house rate of 1s. 6d. per cent., there are several considerations which must be weighed by an insurance company before accepting individual risks. The construction of the building, and its situation, both as regards accessibility in case of fire, for salvage and for extinguishing purposes, and also as regards isolation from any dangerous premises in the vicinity, must be carefully considered. Of course, if the studio is part of a building in which some hazardous occupation is carried on, it will share the danger and the increased rate of premium with the rest of the building.

To sum up the whole matter, the position seems to be about thus: The insurance offices do not care to reduce their rates as the risks reduce, unless pressure is brought to bear from outside, and in this inaction they simply follow the ordinary rules of business. Photographers, in a very great number of cases, are paying rates far beyond what the risks warrant, simply because they are too indifferent to take action to secure fair treatment.

The few quotations of rates that we have given in this article will serve as some rough guide as to what ought to be charged, and it will be well for those who feel that they are being unfairly dealt with to look into the matter, and, if their present offices will not treat them fairly, transfer to some other, which offers them some consideration.

TO THE PHOTOGRAPHERS OF AMERICA.

At Boston, last year, the Photographic Association of America, at the suggestion of the veteran photographer, Mr. J. F. Ryder, of Cleveland, O., sought to do honor to Daguerre, the father of photography, the honor to take form in a memorial, in granite, bronze, or some like substantial material, and of such appropriate design and cost as would do credit to American photographers and be of interest to the country whose citizens we wished to remember, and that it be placed in the Smithsonian Institution or grounds at our national capital. To this end a committee was appointed, consisting of the Executive Committee of that year. The suggestion that it be completed and placed in time for our next Convention at Washington, D. C., was generously received.

The committee went to work to carry out the wishes of the association in the

way they thought most effective and most likely to meet the approval of all. The popular sum to be paid by each contributor was one dollar. Upon this basis we prepared eighty (80) books of one hundred receipt blanks and stubs each, and placed them in the hands of sub-committees to work as they best could—the task of filling them being a comparative light one, if handled with a fair degree of enthusiasm, and as you see would realize the sum of \$8,000. This would only be receiving the support of about one-third of those engaged in photography in the country.

The committee, in good faith, approved and adopted a design at a cost of \$6,000; a less sum than was thought easy enough to raise. We feel confident that when completed it will meet the approval of all, and be an agreeable surprise even to its most ardent admirers, for we can assure you that none but an artist of merit and ability has been employed to do this work, and one who is recognized as among the best in the metropolis of our country, namely, Mr. J. Scott Hartly, of New York.

We have helped to urge forward this work, making it one of the attractive features for our next convention. The funds have not all been raised yet, hence we make this appeal. We judge that you all realize the fact that the association is responsible for the payment of this contract, so it behooves us all, as its members, to come forward harmoniously, as one man, and see that the amount be raised. Can't we lay aside our petty differences and act together for the good of a common cause? We have been hindered much (by the apathy and indifference shown on the memorial work) in our convention work this year, yet we feel it is not too late if all come forward to carry it through to a grand success. We owe this much to our association, which is just coming into its days of usefulness. Then don't let discord arise and destroy all this work of years, for which so many have labored so hard.

And to those who have not yet done so, the sum it seems is so small that almost every one connected with the business could and would be willing to give one dollar to help this very commendable work along and show your appreciation of the man who has handed down to you so beautiful an art. Any of the journals or stock-houses are authorized to receive these dollar subscriptions, so send along at once. And to the dealers and manufacturers—as there is nothing that counts like a personal appeal—give your traveling salesmen, who meet the photographer, a book, and set them to work, and in a short time more than enough could be realized to insure all. Will you all, in the name and for the sake of our association, go at it? And we shall see one of the best conventions it has ever been our pleasure to attend.

Fraternally yours, J. M. APPLETON.

[From the *British Journal of Photography*.]

THE NEW BENZOLINE LIMELIGHT.

BY ALBERT W. SCOTT.

IV.—NIPPLES.

In the preceding article we found, both by theory and by experiments, that the more carbon is consumed in a limelight flame the hotter does the latter become, and the more brilliant is the light with nipples of one-fourteenth of an inch bore.

This may at first sight appear irreconcilable with our sixth axiom, which states that the limelights of coal-gas and hydrogen are about equal in brilliancy with the same size of nipple. The explanation is simple: the oxyhydrogen flame is not so hot as the oxycoal-gas flame, and does not produce so high a degree of incandescence on the lime; but it has a greater specific heat, and is, therefore, capable of producing a larger area of incandescence than coal-gas; thus the hydrogen limelight is a larger light than the coal-gas light. What is lost in intensity is gained by greater area, on the same principle that a large oil lamp may give as much light as a tiny limelight.

The oxyether light is very similar to the oxyhydrogen in its properties, and hence is said to give a spreading flame on the lime—to yield a large light with a small aperture in the nipple. With ether, as with hydrogen, large bores cannot be used.

For ordinary lantern work, an incandescent area of 1 inch in diameter is not too large; hence there is no loss of light caused by the use of pure hydrogen, as the area does not exceed this amount.

For microscopic enlarging, in which an illuminant larger than a quarter-inch diameter is not required, the coal-gas light should be superior to the hydrogen light.

Our fifth axiom states that the maximum bore of nipple in the case of pure hydrogen is smaller than in the case of coal-gas; the question arises: Why this should be so? The explanation is the same as before: the hydrogen flame has a greater specific heat than coal-gas.

The rapidity of flame in passing from one particle of gas to another is limited. Inside a tube, a definite period of time is required for the passage of the flame from one end to the other; and if the tube is cold it is evident that the flame or superheated steam is cooled during this passage. If the bore is narrow and there is an opposing current of gas proceeding in the contrary direction, the time required may be so prolonged that the steam is cooled to a degree which will no longer inflame the oxyhydrogen gas touching it; hence, in a narrow-bore nipple the flame does not "pass back." When the opposing current ceases, or becomes too weak, the flame can travel more quickly through the bore of the nipple, and once it gets past the narrow part, it goes on without hinderance, and produces a "pop" more or less loud in proportion to the quantity of explosive gas it can reach.

If we were to pass hot water through a lengthy lead pipe of half-inch bore, the fluid would proceed a considerable distance before it was cooled to the normal temperature; but if hot air was passed through a similar tube at the same rate of speed, we should find that the air was cooled almost immediately. This is because water has a far higher specific heat than air has; the former absorbs vastly more heat in rising to a certain temperature; and in the cooling process water gives out much more heat, and takes a longer time in parting with it than does an equal volume of air.

The oxyhydrogen flame is superheated steam possessing a high specific heat; the oxycarbon flame is intensely heated carbonic acid gas, of only one-half the specific heat of steam; hence, in passing through a narrow bore in cold metal, the oxycarbon flame is cooled in one-half the time required for steam; and, consequently, the oxycarbon flame can be safely burnt in a nipple having a bore twice as large as the oxyhydrogen flame. The maximum bore with pure hydro-

gen is about one-eighteenth of an inch ; theoretically, the maximum bore of an oxycarbon flame should be one-ninth in diameter.

Hence it follows that the more carbon is consumed in a limelight the larger is the size of bore in the nipple available. The maximum bore with the coal-gas limelight is greater than with hydrogen, also greater still with benzoline, and again larger with benzole.

Two or three factors have been omitted in the foregoing remarks, such as the initial heat of the oxycarbon flame being greater than that of the oxyhydrogen flame, etc.; but these appear to nullify each other, and their consideration would be too abstruse and speculative.

It was this theory which attracted my attention to the use of benzoline for the limelight. It is to some extent supported by facts, as in the comparison of hydrogen and coal-gas ; but if anybody can devise a more plausible theory of nipples than this, I am quite willing to accept it as truth.

As carbonic acid gas has a lower specific heat than steam, it follows that the more carbon is consumed in a limelight the smaller is the area of incandescence. Owing to this there is little gain of light produced, in the case of small-bore nipples, by using benzoline instead of coal-gas, because coal-gas, being richer in hydrogen, gives a larger area of illumination than does benzoline, and experiment shows, with a nipple of one-twentieth of an inch, that a light of only 400 candles is obtainable with benzoline, even with a high pressure of oxygen.

Hence, to get the full advantage of benzoline it is necessary to use a nipple with bore sufficiently large to heat a large portion of the lime. This is accomplished by an aperture of one-fifteenth of an inch, which is capable of heating the whole side of the lime with a high gas pressure. With such a nipple the advantage of benzoline is very marked.

Benzole gives the brightest limelight, but is not a large light. Its brilliancy is four times as great as that of a good blow-through jet with coal-gas, though the area of incandescence is about the same. There is, I understand, a demand in certain quarters for a limelight which gives a great light from a small point ; for the lantern microscope the benzole light ought to prove useful. A one-fourteenth of an inch nipple answers well for it, though doubtless a large bore could be used.

The oxybenzole flame may also prove useful in scientific or laboratory work, such as destructive analysis of refractory substances, its thermometric heat being considerably higher than that of the oxyhydrogen flame.

As I have recommended large-bore nipples to be used, it may be as well to state that the correct size of aperture is only one condition of a good nipple ; if the other conditions are not satisfied the light will be both poor and noisy. With most jets in the market having small bores the enlarging of the orifice to one-fourteenth of an inch would probably spoil the jet ; and if the operator does not understand the principles involved in the making of a first-class nipple, he will do wisely either in leaving his jet alone, or else in intrusting it to some person who makes a specialty of the limelight. A good nipple of large bore costs little, and is very easy to make, provided you know *how* to do it. Experience shows that platinum tips are a mistake with large-bore nipples.

In a previous article I mentioned that the light benzoline would probably be found suitable for dissolving. This point has been settled, and the warm bath saturator is now applicable to biennial and triple as well as single lanterns. There is no tendency to pop, and the manipulation is precisely the same as with coal-gas. The saturator is found to be workable by unskilled operators, and it gives less trouble than does the filling of a bag with coal-gas. All one has to do is to fill the vessel with the proper fluid, and to light the nightlight, connect the three brass nozzles to the cylinder and jet taps, and then leave the saturator to take care of itself till the exhibition is over. The working cost, in fluid and nightlights, is twopence per hour, the oxygen is the same as with coal-gas, and the light is much better with proper nipples.

The warm bath saturator is, I believe, the only one in the market which can be used safely with a blow-through jet.

THE WASHINGTON EXHIBITION.

FIRST VICE-PRESIDENT HASTINGS writes us that exhibitors desiring to be represented at the Washington Exhibition must have their exhibits entered by July 15th. Entries should be made by application to G. H. Hastings, 146 Tremont street, Boston.

Exhibitors should also take notice that no exhibit for the Grand Prize, or Classes A, B, C, D and H, is to occupy space of more than 8 linear feet, and in Class F 10 linear feet. In a former circular this latter was printed Class H.

ANTHONY'S PRIZES FOR BROMIDES AND PHOTOGRAPHS FROM NEGATIVES MADE UPON CLIMAX FILMS.

Our publishers offer the following prizes in competition at the Washington Convention of the Photographers' Association of America, August 12th to the 15th inclusive, 1890, as follows:

1. For the best collection of Plain Enlargements upon Anthony's Bromide Paper, at least six in number, and not smaller than 11 x 14 inches, \$100.
2. For the best Crayon Worked Enlargements on Anthony's Bromide Paper, at least three in number, and not smaller than 11 x 14 inches, \$50.
3. For the best exhibit of Landscape Photographs from negatives made upon Anthony's Climax Films, not less than twelve in number nor smaller than 5 x 7 photographs, the negatives to become the property of E. & H. T. Anthony & Co., \$50.

Competitors must forward their exhibits, prepaid, so that they will reach Washington, D. C., by August 10, 1890.

Prints may be framed or not, at the option of the exhibitor.

Each package must contain a sealed letter stating the name and address of the exhibitor and his private mark outside, a letter being also sent to our publishers with same private mark only; but on no account must any other than the private mark appear on the pictures themselves. Instruction as to the class in which they are entered must also be given, and the pictures numbered on the back to correspond with the number given in the class entry. Judgment will be given to the distinguishing mark, but the awards will be announced with both mark and name.

Be sure and ship your exhibits in good time, as those arriving late will not be apt to get a good place, and will run the risk of not getting there in time to be entered for competition.

All exhibits will be subject to the Association rules. All art exhibits must be sent to George H. Hastings, Art Department Photographers' Association of America, Washington, D. C. All charges prepaid.

OUR ILLUSTRATION.

THE cool and refreshing illustration which serves as a frontispiece to this issue of the BULLETIN was made by Mr. W. I. Scandlin, one of the staff of the BULLETIN. The subject is by no means an easy one and the success of the pictures speaks well for the skill of the photographer. We hope, in addition to the artistic effects presented in the prints, that the fantastic and weird forms of last winter's snow may palliate the intensity of the present torrid times.

Dinner was waiting at the Prospect House. Afterward, when every body could "look pleasant" with sincerity, the party of camera young men and women were photographed in groups on the hotel steps, and little exploring parties went outside the settlement for scenery. At 3 o'clock the homeward trip was begun by making a detour to the picturesque Dumplings and past old Fort Adams. The boat touched at Newport. It was in running near the schoolship and warship in the harbor that the only accident of the excursion occurred. Everybody was pointing a camera at the vessels, and a gust of wind lifted Mr. Wesel's tripod camera and hurled it overboard from the upper deck. The steamer put back, but when the camera was recovered the lens, the most valuable portion, was missing.

The excursionists reached the Continental Wharf a little after 7 o'clock. To the Executive Committee of the Providence Camera Club, who organized and so successfully consummated the outing, the visiting clubs expressed their thanks and pleasure. The committee was composed of L. L. Anderstrom, H. H. Davison, H. J. Reynolds, W. L. Coop and J. A. Miller, besides the club officers, President R. C. Fuller, Corresponding Secretary J. E. Davison, Recording Secretary C. A. Stoddard and Treasurer Arthur B. Ladd.

ROCHESTER CAMERA CLUB.

BUSINESS MEETING, MAY 16, 1890.

THE new Constitution was presented and adopted. Papers having been made out incorporating the Camera Club of Rochester, the Board of Directors, G. H. Croughton, J. L. Willard, H. W. Mathews, E. W. Horne, G. W. Haskins, Willis Gove and W. A. Page, signed same, and it was forwarded to Albany.

BUSINESS MEETING, MAY 29TH.

AFTER usual routine of business *President CROUGHTON* gave a talk on "The Theory and Practice of Development," which was one of the best things of the year. As a normal developer he recommended 1 dram of each of the following solutions to 2 ounces of water:

SOLUTION I.

Carbonate of potash.....	3	ounces.
Water.....	12½	"

SOLUTION II.

Pyro.....	1	ounce.
Sulphite of soda.....	4	ounces.
Bromide of potassium.....	41	grains.
Citric acid.....	60	"
Water.....	12½	ounces.

ANNUAL OUTING, DECORATION DAY, 1890.

Twenty members of the Club assembled at the Central Depot early in the morning, having faith the clouds would pass away and the rain stop for an especial benefit. Fisher's Station was the destination, which was reached in about half an hour. The rain continued all the forenoon, so no views were taken until after 2 o'clock. The place abounded in culverts, mills, etc., and when the sun did come out

the members were soon at work, and some very pretty bits were secured. All voted that a visit be made again at an early opportunity.

BUSINESS MEETING, JUNE 13, 1890.

Dr. Weigel gave an exposition of the action of eikonogen as a developer of bromide paper. Experiments were made as to the comparative merits of this and pyrogallol as developers on plates and bromide paper, resulting in the verdict that the eikonogen made better negatives, but with no great difference with bromide.

G. R. ADAMS,
Assistant Secretary.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—W. H. D. incloses two prints and writes: Will you please inform me what makes my paper turn yellow when I burnish the prints, also the cause of the spots? Is it a fault of the baths? I use silver bath, 1 ounce to 10 of water, a few drops ammonia. The toning bath is O. P. Scott's, of Chicago. I have had to throw out lots of pictures this week. I have had large prints, and they have been quite damp for two or three days. Would that cause the trouble?

A.—The yellow color of the prints is probably due to imperfect fixing or washing, or both. The prints should be fixed in good clean hyposulphite solution, and care should be taken that too many prints are not fixed in the same bath. Sufficient time, say twenty minutes, should be given to the fixing process, and then thorough washing. Constant changing of the prints in the fixing bath and wash water is more important than anything else to insure good results. The spots appear to be a defective piece of paper.

Q.—W. McC. writes: We are engaged in making solar prints, by the old silver process, but wish to get hold of some of the new processes for either platinum or the developed print. Can you advise us where to go for the above?

A.—Try the bromide paper made by our publishers; it works nicely here, and it is used in California. Sam C. Partridge, of San Francisco, keeps it, or you can get it from our publishers direct. We have ordered pamphlet of instructions and other information to be sent to you; the details are too long and not suited to this column.

Q.—H. A. writes: Will you please give

me quantitative formula for the hypo bath to prevent blisters, and at the same time to do the work as quickly as may be? The length of time the paper stays in the fixing bath is of importance to me.

A.—A bath of one of hypo to twenty of water is very effectual in preventing blisters, but the time of fixing will be from thirty to forty minutes, and the prints should be moved constantly. If a bath of one in ten is used the fixing may be done in twenty minutes, but care must be taken not to have the temperature of the bath above 70 degrees Fahr.

Q.—J. J. F. writes: I notice in the BULLETIN the offer of prizes for "the best plain enlargements on Anthonys' paper." Do they allow the prints to be spotted out? Please send me full particulars.

A.—Yes, you may spot the prints, but that is the limit; otherwise they become worked enlargements and take second prize.

Q.—A. B. C. writes: is there any such thing as making a photograph direct in the camera without the negative; if not, could not such a thing be done by preparing a piece of black or brown paper in like manner to a ferrotype plate? It seems to me that it could be done, but I do not know anything about it. I do not think it would make as good a photograph as the paper printed from the negative. But it seems to me it would make as good a picture as the permanent bromide, which has to be exposed through the negative and developed.

A.—Your idea has already been developed in the form of the ferrotype dry plate. This is a ferrotype plate coated with a special gelatine-bromide emulsion, and developed in the same manner as an ordinary gelatine plate. We believe these ferrotype dry plates are still in the market.

Q.—A. M. writes: I am not a member of the Photographers' Association of America; however, I would like to compete for the prize you offer if non-members are allowed the privilege.

A.—You must become a member of the association if you wish to compete for the Anthony prizes.

Views Caught with the Drop Shutter.

G. H. HASTINGS, the First Vice-President of the Photographers' Association of America, will occupy a new studio about June 15th. All the rooms will be on one floor, and only one floor above the street.

At the Hotel Thorndike, Boston, June 26th, the first annual dinner of the Mystic Camera Club was held. After the viands had been disposed of, President Joseph H. Wheeler presented Rosewell B. Lawrence, of Medford, as the first speaker. His remarks were of a humorous nature, and were highly appreciated by the forty ladies and gentlemen present. He was followed by H. A. Hough, George D. Boles, representatives of the press, and Frank P. Aymar. This organization is composed of amateur photographers from Somerville, Malden, Melrose, Everett, Chelsea, as well as Medford and Boston. A pleasant accompaniment of the evening's entertainment was the music furnished by the Hillside Banjo and Guitar Club. The menu cards were adorned with a specimen of the work of some of the members.

SWEET, WALLACH & CO., the well-known photographic merchants of Chicago, have moved into new quarters, 215, 217, 219 and 221 Wabash avenue. This has a frontage of 40 feet and is 100 feet deep, giving nearly 10,000 feet of floor space. They will have one of the largest stocks of photographic apparatus in the West, and invite everybody photographically inclined to visit them.

WE note that license has been issued by the Secretary of State of Illinois to the Jackson Photographic Company, to do a general photographic business in Chicago. The capital stock is \$10,000, and the incorporators are Allen Jackson, Ralph W. King and E. F. Thompson.

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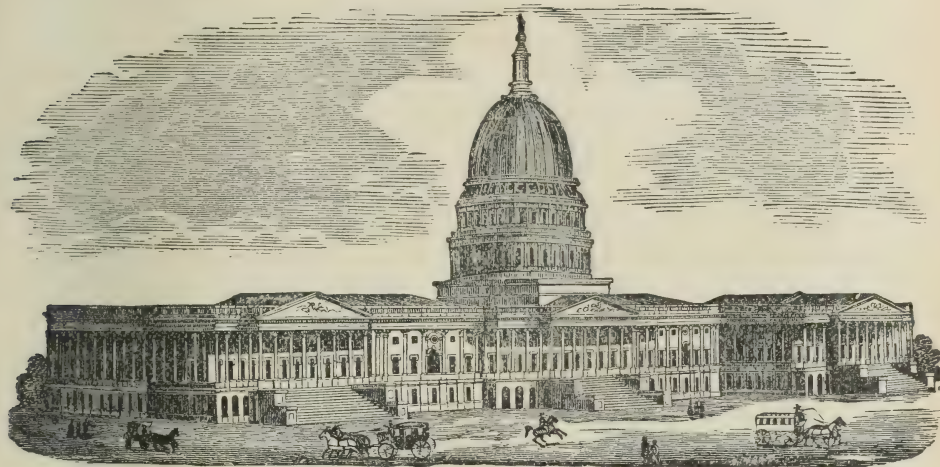
ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

JULY 26, 1890.

Vol. XXI.—No. 14.



TO WASHINGTON, D. C., AUGUST 12TH.

THERE is no doubt that the coming meeting of the Photographers' Association of America will be one of the most memorable in the annals of American photography. It will be more a meeting of the photographers than any previous meeting, for although the manufacturers and others connected with them will be represented, there is a strong feeling that they will be very little interested in the meeting as such—the entire membership of the association being determined to make the meeting an exhibition of American appreciation of the work of Daguerre. To this end everything will be done to make the various sessions of the convention interesting and instructive.

In another place we give a letter from Mr. J. M. Appleton, the President of the Photographers' Association of America, in which he calls attention to the various attractions to be found at Washington, and those especially interesting to photographers.

In addition to all that President Appleton has to say upon the subject, we feel that there is something more than the merely immediate return which should take photographers to Washington. There is the force of the unity of action of numbers. If photographers would be more united in their actions, and would have less bitter and personal feeling toward one another, they would accomplish much more good for the art, and indirectly benefit themselves in a

purely utilitarian way. There is too much calling bad names, there is too much stirring up of the mud of human nature among certain photographers. This feeling is entirely derogatory to the advancement of photography and all connected with it. Now, we believe that there are enough good men, honest, true and gentlemen, connected with the Photographers' Association of America to make it worth while for every member of the fraternity who loves his art to join hands with them for its general elevation.

To those who do not belong to the association we would say, come to the Washington Convention, see how much you can learn, not by standing around and looking on, but by taking an active and earnest part in the proceedings. Send some of your work for exhibition or competition; get some of the good honest fellows there (and we know lots of them) to criticise it, and you will be delighted at the result. You may feel taken down a little by some of the verdicts, but go home again, think about what was told you, and try again. Honest judgment by impartial critics is worth more than you can now believe, especially if it teaches you to see your own faults.

Those photographers who have certain ideas about the manipulation of the art, and would like to have them discussed, should attend the meetings and bring their thoughts before fellow workers.

There are quite a number of important ideas worth taking up. The founding of a fund for disabled and superannuated photographers would be well worth bringing before the meetings. Not a selfish combination, but a truly benevolent arrangement, that the unfortunate and fortunate alike may be equally interested in, and entirely unconnected with anything like life insurance. In a purely business way, the question of fire insurance should be discussed, with a view to the lowering of the present high rates paid by many photographers. Yet another matter of much interest is the unification of the screws and fittings of lenses, so that all lenses of the same size but by different makers should fit the same flanges of cameras; also, that all diaphragms should be made on some special system that is easily intelligible to all using lenses. These and quite a number of other ideas could be very profitably discussed at the meeting at Washington. But to give them power before the world, to show people at large that photographers are an important class of citizens, it is necessary that they should unite to attain their ends. In the Photographers' Association of America they have a duly organized and incorporated society of men whose aim is the elevation of the art of photography. It is the duty of every intelligent photographer to join this association, not for what he will personally obtain directly from the association, but because he should help to elevate the art; and in so doing he will indirectly benefit himself. Disconnected effort amounts to nothing; this is the reason a mere handful of soldiers well organized will entirely overcome a mob ten times their number. Photographers should remember this fact and unite. Don't go to Washington with the idea that you will find everybody thinking just as you do, and remember that each one has a right to his opinion. Hear all that is said and judge of the average opinion. This will be most certainly nearer the truth than the opinion of any individual alone, although it may not be the truth itself. Be impartial, be good natured, and remember there are lots of good fellows that think as you do and will work with you, if you will only show them what you want.

Go then to Washington on August 12th, and make your influence felt by your

presence there. Don't think that one will not make a difference, but remember it *you* and *you* every time that are needed to help the cause along. Let the unveiling of the monument to Daguerre be the beginning of a new era in American photography. Let every photographer feel that he is part of a goodly band of workers whose aim is the elevation of our art.

L'union fait la force.

EDITORIAL NOTES.

ONE of the most interesting of recent judicial decisions bearing particularly on photography has just been handed down by the Supreme Court of Minnesota, in a case which has been before the courts of that State for about a year and which has been carried through the lower courts to the Supreme Court. The case in point hinged on the fact that in 1887 A. B. Rugg, a photographer, made some photographs of a Mrs. Ida E. Moore; later, Rugg gave or sold a copy without the knowledge of the sitter to a person who happened to be a detective, and who, it was proven, exhibited the picture in a general and promiscuous manner. On the facts coming to the knowledge of the sitter, she at once sued for \$5,000 damages. In affirming the decision of the lower court, Judge Collins says: "There is an implied contract between a photographer and his customer that the negative for which the customer sits shall only be used for the printing of such photographic portraits as the customer may order or authorize." As this decision is in effect the same as one recently given by an English court, and accords with both justice and common sense, it would seem that this much mooted question had reached a final settlement.

THE rapid strides being made in the photography of astronomical bodies was demonstrated at a recent meeting of the Royal Society of Great Britain, before which papers were read by Dr. Huggins on "A New Group of Lines in the Photographic Spectrum of Sirius," and another by Mrs. Huggins on the "Photographic Spectrum of the great Nebula in Orion." The advances in this direction are perhaps the most noticeable of the present time.

AN enterprising firm of photographers in one of our Western cities has devoted its efforts toward building up a line of work in close connection with the law courts of the vicinity, their specialty being the copying of documents and drawings to be used as evidence in cases and the general collation of silent witnesses, by the aid of the camera and lens, which bids fair to handsomely repay them for their new venture.

ONE of the most exhaustive and instructive exhibitions of photography and its allied sciences ever held has lately closed in London under the auspices of the Photographic Trade Section of the London Chamber of Commerce. The exhibition was confined to professional work and included all developments in new processes and apparatus. The list of contributors numbered between sixty and seventy, and the result of the exhibition has been highly gratifying to the projectors and cannot but have a good effect upon all who were so fortunate as to have seen it.

WE note from our exchanges that some of the manufacturers of bottles, graduates and receptacles for fluids are about to produce them in transparent celluloid instead of glass, as formerly. When this is accomplished we may look for less breakage in the dark room than at present.

THE Photographic Society of Vienna has awarded a medal to H. Laudaurek, of Teschen, for a method of reproducing and restoring prints which have faded. The published formula for which this medal was awarded is as follows:

No. 1.

Tungstate of soda.....	100 grams, or 3½ ounces.
Distilled water.....	5,000 c.c., or 175 “

No. 2.

Carbonate of lime (C. P.).....	4 grams, or 62 grains.
Chloride of lime.....	1 gram, or 15½ “
Chloride of gold and sodium.....	4 grams, or 62 “
Distilled water.....	400 c.c., or 14 ounces.

The second solution should be made in a yellow glass bottle well protected from the air, and allowed to stand for twenty-four hours, after which it should be filtered into another yellow bottle and kept well corked. For use, say for a sheet of albumenized paper, take 5¼ ounces of No. 1 to 1 to 2 drams of No. 2, and place the faded prints, one at a time, therein, after having first washed them thoroughly. The intensification must not be too much in hot weather; ten minutes will probably accomplish the purpose intended, and if the conditions are right a beautiful clear purple color will result. Care must be had not to have an excess of chloride of gold in this bath. To fix the prints 5½ ounces of solution No. 1 should be used with 4 drams hyposulphite of soda, in which the prints, after being thoroughly washed, are immersed until the yellow color has entirely left them, when they must again be washed; the fixing will require from three to five hours in some cases.

OUR neighbor across the water, *The Practical Photographer*, in commenting on a picture of two girls enjoying a toboggans lide, which they introduce as an illustration to an issue of the journal, say that they believe the original from which theirs was reproduced first appeared in *Wilson's Photographic Magazine*. We would correct this impression, and refer them to the BULLETIN of December, 1886, where they will find the print in question.

WE notice that Professor Himes, one of the contributors to the “International Annual,” has gone abroad with his family for a much-needed rest, after a continuous term of service of twenty-five years as Professor in Dickenson College. We wish him a pleasant trip, and hope the rest and change may be of great benefit to him.

A SYSTEMATIC research is being made by the Photographic Society of Geneva with a view to determining whether or not, as has been so often said to be a fact, people grow to resemble one another in feature after long living together. As far as investigations have been carried, the weight of evidence goes to prove that such is the case, and that husband and wife who have lived together for twenty or more years are more apt to bear marked facial resemblance to each other than

brother and sister. There is a good opportunity for a like investigation in this country, in which case the family album will have to be brought out again.

At the last meeting of the Hartford Camera Club it was decided to hold no meetings during August, and in the meantime the committee appointed for the purpose are looking for larger quarters, where they may obtain conveniences for sky lights, dark rooms, etc.

WE are interested to note the growing importance which is being attached to aerial photography, and the various inventions and devices for obtaining photographic exposures from suspended bodies. One of the latest attempts in this direction is now in process of development by a French gentleman, M. Denesse, whose idea is to attach to a rocket a parachute containing a cylinder with twelve lenses arranged about its circumference and exposing simultaneously different parts of a sensitive plate, which is in the center of the cylinder, by means of shutters which open and close automatically as soon as the parachute commences to descend. The parachute and cylinder camera attached are recovered by means of a cord which is secured to it before the firing of the rocket.

As we go to press, the American Association for the Advancement of Science is preparing for the opening of its thirty-ninth meeting in Indianapolis, Ind., Section B of this association embraces photography, and the meeting of this year is intended to be of unusual interest to members and friends.

The meeting commences on Tuesday, August 19th, at noon, and will continue till the 30th.

HERR A. STIEGLITZ, in a communication to the *Photographische Rundschau*, attributes the failures in intensification with sublimate and ammonia to four causes, the first of which he says is insufficient washing after fixing, producing yellow spots on the negative; again, he recommends the addition of hydrochloric acid to the mercury bath to dissolve any remaining traces of fixing soda, and for weak negatives suggests that a dilute solution of sublimate only be used; thirdly, he claims that insufficient washing before treating with ammonia causes a precipitate of mercury amide; and fourthly, that insufficient washing after treating with ammonia has a tendency to color the negative brown in places.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Development of Eosin of Silver Plates.—Red Glass and Bright Light for Dark Rooms.—Photography in the Balloon.—New Photographic Lenses.

FOR several weeks I have made daily color-table views on eosin silver plates, to obtain new facts about the fluctuating coloration of daylight. About these interesting results I will report later. At present, I want to point only to a remarkable appearance in the development of eosin silver plates.

It is a fact that with these plates the action of chrome yellow is generally stronger than that of ultramarine blue and without yellow glass.

If an eosin silver plate, exposed under a color-table, is developed, no matter what kind of developer is applied, the blue will first appear on the surface and

later on the yellow. If after about a minute's development the plate is now looked at in its transparency, the intensity of the blue is very much stronger than that of the yellow. After prolonged development the matter changes: In the surface view the blue will retain its apparently stronger intensity, but in the transparency one recognizes that the yellow has soon surpassed the blue and appears finally more intense (opaque).

This proves that the action of the blue is superficial, and that the yellow rays penetrate deeper into the film and act principally in the interior of the same.

The practical consequence is, that the development of the color sensitive plates must not be interrupted too soon. The developer has to work through the film, even upon the danger to obtaining over-developed or too-intense plates.

The latter can easily be reduced in case of necessity with red prussiate of potassium (5 c.c. of a solution, 1:5 to 100 c.c. Fixing soda, 1:6-7).

With regard to the developer itself, I was informed by several parties that fresh hydroquinone developer is not suitable for eosin silver plates, and to prove this, plates were sent to me showing fog with fresh developer. Still I am not of the same opinion.

Recently we have worked more than ever eosin silver plates with fresh hydroquinone developer, at the Royal Technical High School, because it gave more intense plates than any other developer, and furnished glass-clear negatives. The only care taken was, that to 10 c.c. of fresh hydroquinone developer, 1 drop of bromide potassium solution, 1:10 had to be added.

In my last letter I wrote to you about red glass for dark rooms. In consequence of several complaints made to me about glasses for lighting the dark room I have investigated the subject somewhat.

Samples of red glass were sent to me, which, although evidently copper-flashed and resembling completely in their outer appearance the red glasses tested and used, proved to be unfit for use by admitting the passage of green light. I received others of such a dark color that they hardly gave any light. I then inquired at some of the principal dealers in Berlin, and found that at present none of them had any red glass in stock suitable for photographic purposes. All the samples shown to me were either too light or too dark.

Now, I will admit that I have already developed with very light glass, yes, even in plain lamp-light, and often without the least disadvantage, only I was careful to expose the plate as little as possible to the light. In the shadow of the light it was taken from the holder, flowed with the developer, and only then brought to light for a very short time, when the image was already distinctly visible. In this way even a bad glass will not do much harm. The developer helps a good deal, too. If colored brown, as in the oxalate developer, the color itself is already a sufficient protection against white light. But what a practical photographer may risk the beginner should avoid. There are dark room lamps of dubious condition, with badly closing doors, the glasses not fitting tightly and admitting the passage of white rays. Some people do not observe this at all, and in their innocence expose still undeveloped plates, and quite dry, to such a lamp, carelessly letting the white rays from the cracks around the glasses act upon the plates for minutes, and afterwards wondering that these stripes make a black mark in the development.

But it is quite different with the doubtful dark room glasses which are bought in good faith. What a loss is caused by them is shown by the letter of an amateur, who had applied a combination of green and yellow glass. He writes that fifty plates out of one hundred were foggy; at the same time it is incomprehensible to me how such combinations of green and yellow glass can be recommended. But even white dark room lights have been recommended. A mixture of cobalt and chloride of nickel solution gives a white or grayish white liquid, and this, poured into a glass cylinder and placed in front of a window, is said to keep back the chemically effective light. To verify this it is asserted that silvered albumen paper remained white for a week behind such a cylinder. This appears so convincing, and still it proves nothing.

Silvered albumen paper is principally violet sensitive; the violet rays of the white light, true enough, are absorbed by the said solution, this being the reason for the albumen paper remaining white. But it is quite different with the bromide of silver plates. These are principally blue sensitive (highest sensitiveness in the middle between the solar lines *G* and *I*), and this very light is allowed to pass by the white cobalt-nickel mixture.

Such a solution is, therefore, as a substitute for the dark room glasses not only without value, but will do harm.

If the solution is taken very concentrated (3 chloride of nickel + 1 chloride of cobalt in 10 water), it will appear partly dark green yellow; it will then absorb the blue almost entirely, but it will admit the yellow and green yellow light, and is, therefore, useless for color sensitive plates. For ordinary plates it might, perhaps, be applicable, if not colored too dark. To make it lighter by dilution is not admissible, because, chemically, blue rays would then pass through.

I therefore cannot enough warn against those so-called white lights for dark rooms.

Those who have a spectroscope handy—a pocket spectroscope is sufficient—can easily recognize this fact; but unfortunately only a very few possess such an instrument, and the largest number of practical photographers and amateurs are deprived of this means of testing their glasses. If a thin copper-flashed ruby glass is held in front of such a spectroscope, it will be observed that principally the blue end of the spectrum is extinguished; towards green the opacity is declining.

Yellow green passes through to a perceptible degree; but in the yellow a stronger extinction is shown in the shape of an absorption stripe.

Copper-flashed ruby glass, of such a thinness that it will admit the passage of gases with widely opened spectroscope, cannot be used for photographic purposes.

Two such thin glasses, placed together, may be used, but the light of course is considerably darkened.

It is better to apply gold glass for the correction of such a thin copper-flashed ruby glass. This pink glass by itself is useless for photographic purposes, because it admits green, yellow, blue and violet, and absorbs only the green light.

But if such a gold glass is put together with a thin copper-flashed ruby glass, the former will absorb all the green light which found passage through the thin copper-flashed ruby glass. This combination will then admit only the passage of red and orange light, and appears much lighter than two copper-

flashed ruby glasses placed together. A good red dark room light should be so light that at a foot distance from the glass ordinary sized type can be read. The use of daylight I do not advise, because of the danger of too much intensity, and many red glasses suitable for lamp-light are entirely useless for daylight.

As the red glasses ordinarily found in market change their quality very often, and as of even one and the same sheet one side may be good and the other useless, my son, E. Vogel, has tried to produce artificial red glasses for the dark room, by coloring gelatine with some suitable coloring matter and pouring the same upon glass. Such glasses have proven to be excellently fitted for the purpose, and gave double the light of copper-flashed ruby glasses.

It has only to be discovered yet how long this coloring matter will keep.

An interesting application of photography has now been found in the balloon.

The German Society for the Progress of Aeronautical Traveling has built a balloon, through one of its members, Mr. Gross, which, furnished with all the arrangements to note automatically all meteorological proceedings in the higher regions, and fastened to an 800 m. long and 7 mm. strong wire of Wolfram steel, ascended lately for the first time from Charlottenburg (near Berlin), and will now be used regularly for scientific observations. The building of this balloon, which on the occasion of its first ascension obtained the name of "Meteor," was connected with a great deal of trouble and much expense, but the latter has been reduced by Messrs. Siemens donating the wire, and Herr Rudolph Hertzog, who gave the necessary silk. The balloon will have instruments for measuring electricity, moisture, heat, and air currents.

The result of the measurements taken in this way is marked by means of an insulated copper wire, which is inside of the cable, on an apparatus fastened to the latter on the ground, and partly it is done in the balloon by an independent photographic apparatus, even at night. At certain periods the photographic camera opens and ignites at the same time an electric light which illuminates the instruments whose notes are to be registered. The balloon ascended the first time in seven minutes to a height of 800 feet, but it took an hour to get down again. With a complete apparatus this will be accomplished in a much shorter time. The trials terminated to the satisfaction of the members of the society and their guests, among which were some eminent scientists, like Privy Councilor von Helmholtz, Privy Councilor Blenck, Director of the Royal Statistical Bureau, Dr. von Betzold, etc.

Since entirely new optical glasses have been put into the market by the new optical institute at Jena, to the advantage of domestic and foreign opticians, photographic optics have made a great progress, and objective constructions appear of which we had no idea before. Thus the celebrated microscope firm, Carl Zeiss, in Jena, enters with new constructions which differ from all previous instruments and deserve the highest consideration.

There are two different styles of construction, one a triplet and the other a doublet.

The triplet is, in general, a symmetrical construction, and consists of a triple cemented lens, inclosed by two single lenses. The same is at present in a form which, as a universal objective, might find application.

The proportion of the diameter of the outer lenses—which proportionately are not very distant from each other—to the focal distance of the system, is equal to 1 : 4.3; that of the largest active opening to the focal distance, 1 : 6.3.

There is, therefore, by this latter opening a large field evenly illuminated, and as this opening might satisfy all requirements in portraiture, the objective would be useful for this purpose. It would also find good application as an out-door instantaneous objective, on account of the peculiar brilliancy of the picture.

The doublet (anastigmat) is completely unsymmetrical. It affords, by accomplishing all claims to a complete instrument (spherical and chromatic correction in and outside of the axis, evenness, orthoscopy), an almost complete abrogation of the astigmatic defect of oblique rays—obtained by a particular glass—a combination, which heretofore has not existed.

The result is that the picture field of our new doublet appears evenly sharp upon the photographic plate in greater extension than the heretofore well known best constructions (aplanat and antiplanat).

This advantage is particularly observable in such views, when towards the edge of the picture a great depth of delineation is demanded. As aside from this the style has admitted the application of the most colorless new glasses of the glass-technical laboratory here—the baryta flints and the light crown glasses—the doublets are particularly rapid, and by the removal of disturbing reflections and the diaphragm spot a particular brilliancy of the pictures is peculiar to them.

The anastigmat for instantaneous views consists of five single lenses, namely, a twice cemented front and a triple back lens. The largest lens diameter is at the same time the diameter of the largest active bundle of rays, and is in proportion to the focal distance like 1 : 6, 3. The picture angle is 85 to 90 degrees. The reflection pictures are also very favorable in this objective, so that brilliant negatives can be obtained.

It is specially intended for instantaneous views, and will probably find also good application in the gallery with suitable light. Focal distances of 110, 150, 220, 310 and 440 mm. are now in progress of manufacture.

I have tried the latter, and have found confirmed everything that has been said about the lenses.

BERLIN, June, 1890.



CHEMISTRY OF IRON AND ITS SALTS AND THEIR BEHAVIOR IN PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

(Continued.)

AMMONIUM FERROUS SULPHATE, $\text{Fe}(\text{NH}_4)_2(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$, is light green, stable, unalterable in the air, soluble in water. Its percentage composition consists of:

FeSO_4	38.78
$(\text{NH}_4)_2\text{SO}_4$	33.67
H_2O	27.55
	100.00.

100 parts of water at	63 degrees Fahr.	dissolve	21.6 parts of it.
“	86	“	28.1 “
“	140	“	44.6 “
“	167	“	56.7 “

It is sold in commerce under the name of *ammonio sulphate of iron*. It is employed in photography. The real reducing agent is the ferrous sulphate, the

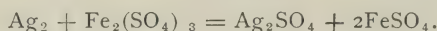
ammonium salt forming argentic sulphate in silver nitrate solutions, which the iron salt reduces.

FERRIC SULPHATE $\text{Fe}_2(\text{SO}_4)_3$ (*Sesquisulphate of iron*).

Ferric sulphate is prepared by oxidizing two equivalents of ferrous sulphate dissolved in one equivalent of sulphuric acid, diluted with water, by nitric acid added so long as nitrous fumes are evolved :

Ferric sulphate is uncrystallizable. By evaporating the solution a very hygroscopic yellowish powder is obtained, soluble in water which it colors red-brown. The solution is alterable in the light, ferric sulphate being reduced to ferrous sulphate.

Ferric sulphate dissolves metallic silver. Ferrous and silver sulphates are formed thus :



The solution, saturated by dissolving the metal with the aid of heat, deposits in cooling crystallized metallic silver and ferric sulphate is generated :



On the former action is based the process devised by A. Gaudin for the reduction of the intensity of negatives and diapositives.*

FERROUS NITRATE, $\text{Fe}(\text{NO}_3)_2$.

This salt is obtained by precipitating ferrous sulphate by barium or lead nitrate. It is not stable.

It is employed in photography for the development of ferrotypes, in order to obtain good, brilliant whites. The solution can be prepared by adding a little potassium nitrate to the ordinary ferrous developer, or by precipitating a part of the sulphate by lead nitrate. The following is a good formula :

A.

Ferrous sulphate	400 grains.
White sugar	100 "
Water.....	8 ounces.

B.

Lead nitrate.....	170 grains.
Water	8 ounces.

Mix, filter, then add 10 fluid drams of No. 8 acetic acid and 4 fluid drams of alcohol.

REACTIONS.

FERROUS SALTS.—Potassa, soda, ammonia, produce in their solution a white precipitate, which turns dingy blue, then red brown in the air.

Potassium ferrocyanide produces, in acid solutions, a white precipitate, which rapidly becomes blue.

Potassium ferricyanide produces a precipitate of Turnbull's blue.

Ammonium sulph-hydrate produces a black precipitate, FeS .

Potassium permanganate in solution is decolorized with formation of a ferric salt. The oxidizers produce a similar action.

Tannic acid produces no precipitate, but in the air the solution turns black from formation of ferric tannate.

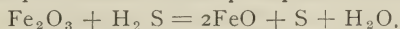
FERRIC SALTS.—Potassa, soda, ammonia, produce a brown precipitate of ferric hydrate.

Potassium ferrocyanate produces a precipitate of Prussian blue.

Potassium ferricyanate colors the solution red brown.

Potassium sulphocyanide produces an intense red coloration. The least trace of a ferric salt is thus detected.

Hydrogen sulphide produces a whitish precipitate of ferrous salt and sulphur:



Tannin produces a blue-black precipitate (ink).

Ammonium benzoate and succinate produce a brown precipitate.

ORGANIC SALTS OF IRON.

Among the organic salts of iron, ferrous formate, $\text{Fe}(\text{CHO}_2)_2$, and ferrous acetate, $\text{Fe}(\text{C}_2\text{H}_3\text{O}_2)_2$, present little interest. They are very unstable. In photography they are employed to exalt the reducing action of the ferrous sulphate developer used in the negative wet collodion process. They are formed in the solution itself by adding a very small quantity of the corresponding sodium salt.

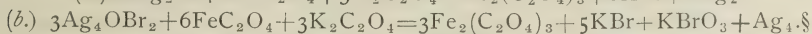
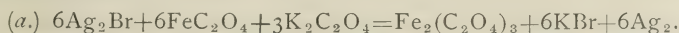
The rationale is the formation in developing of argentic formate, or acetate, which is more easily reduced than the nitrate. Sugar or glucose should be added to the solution.

Ferrous lactate, $\text{Fe}(\text{C}_3\text{H}_5\text{O}_3)$, occurs as small greenish crystals which oxidize rapidly in the air. According to Delahaye it is an excellent reagent for the development of the photo-image.* Monckhoven recommends it for gelatine dry plates.†

Ferrous oxalate, FeC_2O_4 . It is obtained either by dissolving iron in oxalic acid or by double decomposition in mixing a solution of ferrous sulphate with another of potassium oxalate. It crystallizes in small, brilliant, yellow crystals, almost insoluble in water, and soluble in oxalic acid in excess. It is oxidizable in the air, unites with the alkaline oxalates, forming double salts soluble in water. It reduces the salts of silver, gold, etc.

The potassic double salts, $\text{FeK}_2(\text{C}_2\text{O}_4)_2$, was suggested by Mr. Carey Lea for the development of dry plates prepared with silver bromide.‡ In the action potassium unites with bromine and ferric oxalate is formed.

These are the chemical changes according to the physical theory of the action of light on silver salts. According to the sub-salt (a) and oxy-salt (b) theories, they are represented as follows :



To the photographers interested in the theory of our beautiful art we recommend the reading of "The Chemistry of Photography," by Mr. Raphael Meldola.|| It is the best book written on the matter.

* Bull. Soc. Franc. Phot., vol. iv, p. 176.

† The formula stands thus :

Neutral potassium oxalate.....	100 parts.
Ferrous lactate.....	50 "
Solution potassium bromide, 1 : 10.....	2 "
Water.....	500 "

‡ Brit. Journ. Phot., 1877, and Anthony's Phot. Bull., 1878.

§ The reduction by light of the silver haloids into oxy-salts is quite improbable. See the paper of Mr. Carey Lea in the BULLETIN, vol. xx, page 756, and vol. xxi, page 15.

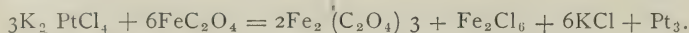
|| London, 1889 : Macmillan & Co. Sold by E. & H. T. Anthony & Co., New York.

Ferric oxalate, $\text{Fe}_2(\text{C}_2\text{O}_4)_3$ is prepared by dissolving ferric hydrate in oxalic acid. It is little soluble in water, soluble in oxalic acid in excess and unites with the oxalates of the alkali metals, forming double salts easily soluble in water. It attacks silver, it being reduced to ferrous oxalate with formation of argentic oxalate, a very unstable compound blackened by light and exploding violently when heated to about 195 degrees C.

Heat and light decompose it into ferrous oxalate and carbon dioxide :

The potassic ferric oxalate is equally reduced by light, and still more rapidly is the ammoniac salt.

Willis' platinotype is the most important photographic process to which the reduction of metallic salts by ferrous oxalate has given rise. As originally devised by Mr. William Willis, it consists in imbuing superficially a sheet of arrowroot sized paper with a solution of ferric oxalate and potassic platinous chloride, K_2PtCl_4 , (Chloroplatinite). Under the luminous action the ferric oxalate is reduced while the platinous chloride suffers little alteration, but when the ferrous oxalate dissolves by floating the print on a warm solution of potassic oxalate it acts on the platinous chloride in being oxidized and the platinum is set free; thus :



The process was well studied and improved by Pizzighelli and Hübl.* As it stands now, the potassic oxalate being a compound of the platinous solution, the operation is exceedingly simple, the image being developed by immersion in cold water and even spontaneously in a moist atmosphere.†

The photo-images obtained by this process are wholly formed by metallic platinum. They are necessarily permanent.

Robert Hunt‡, Dr. Phipson§, Monckhoven||, and other authors have before devised processes based on the reduction of the ferric oxalate in presence of organic substances. All these processes are very similar. A sheet of paper is floated for a few minutes on a strong solution of ferric oxalate, dried, exposed for 10 to 20 minutes, according to the weather and intensity of the negative; well washed in rain water, as in all the processes with iron salts, for water containing lime would precipitate the salt as calcium oxalate, insoluble. A faint image is now visible; to develop it the print is immersed for an instant in a feeble solution of potassium permanganate—an oxidizing agent—to which a few drops of aqueous ammonia has been added, then in a solution of gallotannic acid, gallic acid or pyrogallol, when a proof resembling silver prints in tone is obtained.

Other colored precipitates can be produced; thus after exposure a dark brown is obtained by floating on a very weak solution of argentic nitrate; gold terchloride gives a purple tone; potassium permanganate a brown image; potassium ferricyanide forms Turnbull's blue, etc.

Dr. J. M. Eder applies the transformation of metallic silver oxalate to the reduction of the intensity of negatives. The salt being soluble in sodium thiosulphate (hyposulphite), a solution of this salt is added to one of ferric oxalate, whereby the silver is converted into argentic oxalate, which dissolves as it forms.

* "Die Phototypie," by Pizzighelli and Hübl. Published by the Phot. Soc. of Vienna, 1882, and to which the Veitlander's gold medal has been awarded; "La Phototypie," a French translation of the same, Paris, 1883; Gauthier Villars; Brit. Journ. Phot. Almanac, 1883, p. 48. Anthony's Phot. Bull., 1883.

† Year Book, 1883, p. 177; Anthony's Phot. Bull., vol. xviii, p. 719, and vol. xix, p. 117.

‡ Treatise of Photo., 1854. § Phot. News, 1864. || Bull. Belg. Phot., 1864.

Willis, on the contrary, applies it to their intensification, by converting the silver into silver oxalate and reducing the latter with alkaline pyrogallol or potassium ferrous oxalate.

Ferrous citrate, $\text{Fe}_3(\text{C}_6\text{H}_5\text{O}_7)_2$, is obtained by boiling a solution of citric acid with iron shavings. The solution treated by alcohol precipitates white flakes of triferrous citrate, turning red in the air from oxidation.

Ferric citrate, $\text{Fe}_2(\text{C}_6\text{H}_5\text{O}_7)_2 + 6 \text{H}_2\text{O}$. It is prepared by dissolving ferric hydrate, freshly precipitated, in 1 part citric acid.

It is insoluble in alcohol. Cold water dissolves it slowly. Aqueous ammonia forms no precipitate in its solution; potassa and soda precipitate ferric hydrate. Hydrogen sulphide does not give a precipitate of black sulphide. Ferrocyanide of potassium forms a blue precipitate. Light transforms it partially into ferrous citrate-at the expense of citric acid.

Ammonio ferric citrate, $\text{Fe}_2(\text{NH}_4)_2(\text{C}_6\text{H}_5\text{O}_7)_3 \cdot 2\text{H}_2\text{O}$. It corresponds to this formula when prepared by adding half part of citric acid to the ferric citrate and adding ammonia in slight excess. The solution should be evaporated at 50 to 60 degrees C., keeping the solution alkaline.

It dissolves easily in water, not in alcohol and ether, and possesses properties similar to ferric citrate.

Ammonio ferric citrate was the first iron salt ever used in photography. The process—the cyanotype—due to Sir John Herschel, is that we still employ to obtain blue prints.* The chemical actions are complicated; both salts, the ferric citrate and the ferrocyanide, which constitute the photo film, are partly reduced by light, and the ferrous citrate forms Turnbull's blue with the unacted on ferricyanide, while the ferrocyanide and ferric citrate form Prussian blue. The blue prints may be converted into a black by a solution of tannin with potassium hydrate, or ammonium carbonate into a deep green by a solution of cateches used in the same manner, etc. All these actions have been explained.

A. Poitevin prepares the paper with ferric citrate in a peculiar manner, and advises the photographers to experiment with it.† The paper is floated on a solution of ferric chloride, dried in the dark, then immersed for an instant in an aqueous solution of ammonia, and allowed to dry. By this operation the paper is impregnated with ferric oxide, and when wanted for use brushed with a solution of citric acid at 30 to 35 per cent., dried and exposed under a negative. After exposure the image is not visible. It is developed by floating on a bath of argentic nitrate at 1 per cent. A simple washing completes the operation. The color of the picture is a deep sepia. It can be toned with a very weak solution of gold terchloride or platinum tetrachloride, or better, by a mixture of these two salts.

[From *British Journal of Photography*.]

THE ART OF RETOUCHING.

BY REDMOND BARRETT.

CHAPTER IV.—THE STUDY OF FACIAL ANATOMY.

As the art of retouching is not likely to be mastered without a somewhat lengthened struggle, it will be best to start slowly and with the idea that we know little, if anything, about it. The more modest a man's estimate of his

* Philos. Trans., 1840.

† Bull. Soc. Franc. Phot., 1879.

own abilities is when beginning to learn something of which he knows but little, the more likely he is to surmount all the obstacles that may cross his path. In a lengthened experience I have always found that the beginners who underrated the difficulties before them seldom, if ever, became masters of the art, while those who started by thinking it impossible to succeed have invariably, as the fruit of their hard work and patience, become first-rate retouchers. This does not alter the fact, however, that some will learn the art with comparative ease, while others will never succeed in thoroughly mastering its various methods and technicalities.

It will also be best, perhaps, to keep all descriptions as simple as possible, not resorting to the classical names of the various muscles of the face, showing that we possess that "little learning" which is supposedly so dangerous, but rather as we all hear them spoken of in our daily lives. To many I have no doubt this method of treating the subject will appear rather dull, if not absolutely stupid; nevertheless, it will, on the whole, prove the most advantageous to the student.

For the production of really first-rate work, to possess the ability to determine, at a glance, the necessary amount of labor required on the negative (not only as regards the removal of its defects, but likewise the improvement of its printing qualities), must ever be regarded as the first step towards becoming a competent retoucher. Until this is accomplished it would be folly to advance, for without the power to correctly appreciate the defects of the subject to be treated the efforts of the retoucher must be vague, and in most cases fail to be of any service in gaining an artistic result.

All the niceties of execution may, to a very great extent, be considered somewhat mechanical, but the power to vivify a portrait is an undeniable intellectual faculty, and the constant exercise of the latter will do much to relieve the somewhat monotonous character of retouching as a constant occupation. To carefully study the anatomy of faces generally, and to learn how to portray or to retain in each and every one the various peculiarities of character they may possess, should become, as it were, a second nature to any one intending to take up retouching as a profession. It may not seem easy to acquire this habit at starting, but it must be persevered in, and when once mastered will be no future trouble, but, on the contrary, an inestimable advantage and help.

This study and analysis of facial anatomy will prove not only beneficial to the retoucher in his negative work, but may, later on, serve him as a groundwork should his ambition lead him to essay crayon, oil, water-color, or pastel work. Indeed, "crayon artists" may trace the falling off of their popularity to their neglect of this study. Had they seriously studied the anatomy of the human face, hundreds of the vile productions to be seen in this line would never have been turned out, likenesses would not have been lost, and so forced the public to lose faith in this style of portraiture, once so popular. These remarks are not altogether inapplicable to photographers; how few operators comparatively can insure a really truthful likeness? When they do, however, produce a faultless negative (chemically and artistically), what can be more galling than to have it ruined by the retoucher, who, without any regard whatever for expression, drawing or anatomy, simply directs all his labors to making the negative fine and smooth. In such cases all traces of character are lost; all faces are treated the same, quite regardless of sex or age. The vigor of the man's head

is reduced to the natural gentleness of the woman's, the face of a man of sixty worked as fine and delicately as might be a schoolboy's.

Every individual is possessed of one or more distinguishing features, and it is absolute ruin in their portraits to efface them. Where they exist to a very marked extent it is quite allowable to modify them—even considerably—but they must be retained, although not in such a state as to attract any special attention. If the student, as he progresses, bears these hints in mind he will find them considerable help in enabling him to make with facility such alterations as his good taste may suggest. Thus he may alter the fixed, staring, unnatural look, so common to people being photographed, into an easy, natural smile. Whenever the muscles of the face show a tendency to fall or run down we must raise them, and thus alter what may have been a very sorrowful, if not quite a sinister expression into a happy and pleasing one. The changes thus to be effected are indeed numerous, and practice alone can make the student capable of working them all out satisfactorily.

In all these alterations great discretion must be used, and the beginner must earnestly strive to keep clear of that most usual fault, a tendency to impart too much rotundity to the face. If he do not succeed in this regard his negatives will produce prints absolutely devoid of all character, there being a total absence of all the delicate modulations and half tone which make the pictures life-like. All exaggerations, so numerous in photography, must also be looked to, and are often the most formidable difficulties the retoucher has to encounter. Of all the features the nose is generally the most troublesome. It is quite surprising the number of different shades and expressions that may be given to this feature by the slightest alteration of the light, or the position of the sitter, or the accidental tilting of the camera. This is where the photographer shows his artistic knowledge, and by careful posing and lighting produces a successful portrait of a difficult subject that less skillful hands would have turned out absolutely unpresentable.

In the case of very strong freckles and very deep lines, much will depend upon the operator, as should he light the head carelessly, under-expose or under-develop the negative, the poor retoucher will have double the work. To subdue freckles when they are very bad is an object to be gained, and a very excellent way of so doing is to wash in warm water just before sitting, or even to rub the face well with a rough towel. This produces a general flush or redness, and as the freckles are yellowish, by giving a somewhat longer exposure than usual they will be scarcely visible in the negative. Even in the worst cases this method will so reduce them, and the retoucher's work being consequently so much lessened, that the photographer will be fully recompensed for his extra trouble. We can gain a similar result by using powder on the face, and in this manner we secure distinct advantage inasmuch as the length of exposure is very considerably reduced. The lines across the forehead—and all running in a similar direction—become terribly exaggerated should the operator chance to overbalance his lighting by letting in too much top light, and it is often found a very difficult matter to get the pencil to take sufficiently on such parts. This is still more noticeable should you fail to get sufficient lead to adhere to the negative the first time of touching.

The natural quality of the pencil is such that on its first application a more or less glazed surface is produced, and where greater density may be required, it is

almost impossible (in some cases absolutely so) to effect it with lead. In such cases a little color may be employed, but with great caution, so as not to completely destroy the necessary transparency. However, after some practice the retoucher will be able to judge pretty nearly the density needed in these cases, and will therefore be more firm in his touch, so that a sufficiency of lead may be deposited by the first stroke. In the present system of dry plate work a retouching medium is always used upon the unvarnished film to give it a tooth, the retoucher then sets to work to get all he can on the negative; if more be found necessary (which is an extreme case), the negative can be varnished, and being freshly rubbed over with the medium, the face can be worked upon to the desired extent.

In so-called Rembrandt negatives a slightly different treatment must be adopted to that employed upon the negatives lighted in the ordinary way, as in those more than in the latter the distortions caused by faulty lighting are more likely to be emphasized. The nose is by no means the only feature which becomes distorted or exaggerated, and which demands very skillful manipulation and experience to restore it to its true form. Every line, freckle and mark of every description become more accentuated in this style of lighting. These defects are also very frequently rendered more remarkable should the negatives happen to be under-exposed and over-intensified, which must naturally produce too strong a contrast between the lights and shades. In no case is softness so essential to a really artistic result as in this style of portraiture. In most cases this tendency to hardness may be overcome by the retoucher, and it is his duty to do his utmost in this direction, although, strictly, this defect has more to do with the operating department, as it may be obviated altogether if properly attended to during the operations of lighting, exposure and development. I wish also to draw attention to the too common treatment of some retouchers, who, by their thoughtless method of working produce complete roundness in the shadows. This is all very well when the subject is round and plump, in other words, really round in nature; but should the features be somewhat square and angular such a treatment would be absolutely absurd.

There is really no extra trouble to the experienced retoucher to do all this as it should be done; on the contrary, it only necessitates a little thinking while he is working, and his always trying to preserve in the shadows the formations distinctly shown on the lighted side of the face. The texture of the work, too, deserves some special attention in negatives of this class. Ladies' heads should be very fine and delicate, while men's, especially when they are advanced in years, should be treated with more vigor, which would bestow character and style to the portrait. Many of the failures in this class of portraiture are undoubtedly the result of thoughtless (I will not say bad) retouching. The manipulation may be simply exquisite in such a picture, but all likeness will be wanting, and instead of a life-like portrait it might as well have been a copy of a statue.

Most students of photography must have observed that the labial furrow, or line of shadow running from the nose downward toward the corner of the mouth, is invariably more marked on the light than on the shadow side of the face. This is easily accounted for. We have only to observe that this furrow on the shadow side faces, as it were, the light in which the picture is taken, and consequently is illumined by it; whereas, on the light side of the face it is

crossed by the light, with the result that the muscle over it excludes the light and thereby causes an inordinately dark shadow. This the retoucher can easily rectify. All other lines in the face are governed to a greater or less degree by the same influence, hence the shadow side of the face nearly always contains less modeling and half tone, but being in shade it can be heaped up and balanced by the judicious work of a skillful retoucher.

A beginner may find all this very confusing, but a moment's reflection will show him where the fault lies. Should he not reflect he will start off filling up the shadow side, sparing neither half tone or characteristic marking, and fail to place a light or two to correspond with the other side of the face, thus losing his chance of making a successful picture. I will once more advise all beginners to make a very special study of facial anatomy, and the effects of light and shade thereon. Look well at your friends, examine them under various conditions of light, and you will be astonished at the results. You will discover expressions for the first time that you never thought possible, and that, too, upon faces that were the most familiar to you.

[From *Photographisches Wochenblatt*.]

MINIATURE PHOTOGRAPHS.

BY DR. A. MIETHE.

MINIATURE photography seems to be looked upon again lately with more general interest than for a long time. Miniature photograms, to which primitive lenses are attached, find manifold application in all kinds of novelties, such as penholders, watch charms, necessaires, etc., although they are generally so bad and their value so insignificant that it is hardly worth while to speak about them. But upon other technical and scientific fields miniature photography is of importance. The small scales (micrometer) for microscopes and telescopes are to some extent produced photographically, and in a military point its value has been proven during the siege of Paris, 1870-71, when all communication with the outside world was cut off. A regular pigeon-post was arranged. But as the weight a pigeon can carry is only limited, dispatches had to be concentrated in as small a space as possible. This was done in the following way: Letters, dispatches and stenograms were printed upon sheets containing about 15,000 letters, and such sheets were then reduced upon a prepared collodion film to $\frac{1}{800}$, so that all these communications would not take a larger space than 6 square cm. One pigeon would carry twenty such films, which were rolled together and put into a quill. The weight of such a quill would not amount to more than two-thirds of an ounce. Many dispatches were thus smuggled in, which, in ordinary print, would have formed quite a volume. In Paris these collodion films were transferred upon glass, and with the aid of a projection apparatus and electric light they were thrown upon a white screen and copied. At the Paris Exhibition of 1867 miniature photograms of Dagron were exhibited, showing the heads of four hundred deputies distinctly upon one square millimeter, when looked at through a microscope.

This proves that micro-photographs may become of great importance. Let us see now in what way they are produced, and how the plates are prepared and treated. Dagron's process has not been published, as far as I know, and I had to look, therefore, for a suitable formula. The main point was to produce a

pretty sensitive film, which, with sufficient thinness, will work almost without grain, and still give strong pictures. Ordinary bromide of silver gelatine plates are, of course, completely useless, the grain being proportionally very coarse and already visible under an ordinary glass. Wet collodion is the same. It has a somewhat finer grain, but still it is far too coarse yet.

For the less fine work the chloride of silver gelatine plates may give a possible result, but the plates obtained in market will not give sharp pictures and their sensitiveness is very moderate. The only known process, which proves to be suitable, is the albumen (that is, albumen collodion) process in a modification, as mentioned by Ackland.

The formula is composed of the following :

Alcohol.....	48 c.c.
Ether.....	4 "
Sol. cotton.....	1 gram.
Iodide ammonia.....	1 "
Tincture of iodine (1.16).....	1 c.c.

In the same way iodized albumen is produced ; 160 parts of fresh white of egg are mixed with 1 part glacial acetic acid in 20 to 30 parts of water, avoiding the formation of air bubbles when stirring, and the mixture is then left to clear for two to four hours. A thick film will separate from the lower clear liquid, which is removed from the vessel with a spoon. The next preparation is :

White of egg.....	190 c.c.
Bromide ammonia.....	0.25 gram.
Concentrated liq. ammonia.....	1.7 "
Iodide ammonia.....	1.75 "

The previously prepared thin glass—or mica plates—are now coated in the well known manner with the collodion, washed in a dish until the fatty streaks have disappeared, and are then coated with the albumen, and it is well, before doing so, to pour off a small quantity, with which the plates are flowed several times. The plates are placed edgewise to dry in a room free from dust, and packed between tissue papers. When thoroughly dry they may be kept for a long while.

The silvering is done by plunging them for thirty seconds in the following bath :

Nitrate of silver.....	10 grams.
Glacial acetic acid.....	5 to 10 "
Water.....	100 c.c.

After this they are thoroughly washed under the faucet, and dried free from dust. The plates seem to be indefinitely durable, at least they gave me still good pictures after fourteen weeks.

(To be continued.)

THE CHESTER CONVENTION.

PRESIDENTIAL ADDRESS.

BY PROFESSOR C. H. BOTHAMLEY.

At our meeting last year we were celebrating the jubilee of the photographic negative, and my predecessor in this chair very fitly devoted the greater part of his address to a summary of the history of photography during the past fifty years. Although, as you will remember, that address had a somniferous effect on the delegate from the Leather Bellows Club, the rest of us listened with

much interest to the admirable account of the rise and development of photography which was laid before us. The events of a year usually require much briefer treatment than the events of half a century, and a review of the progress of the past twelve months is unfortunately made easier by the fact that little, if anything, of first-rate importance has been done. No discoveries or inventions of far-reaching influence have startled the photographic world.

Much interest has been excited by the announcement that an Austrian, Herr Veresch, has made a decided step towards the solution of the problem of producing photographs in natural colors. It is understood that the method is based on Carey Lea's researches on the photo-compounds of silver, and that it differs from earlier methods in that the sensitive material is used in the form of an emulsion. How far the results are in advance of those obtained by previous experimenters is a point on which there are differences of opinion. It seems practically certain that at any rate some improvement has been made in the permanence of the images, and we shall look forward with much interest to the results of further experiments by the same worker.

This problem of photographing objects in their natural colors is of very great interest. It seems to be the one thing on which the non-photographic public has set its heart; nor are photographers lacking in enthusiasm. How far these desires are likely to be realized we cannot tell. More or less imperfect photographs in colors have often been obtained, but they are not capable of multiplication in the way in which we make hundreds of prints from one and the same negative. Whether we shall ever obtain a chromatic negative process is at present merely a matter of conjecture. We can only say that the direction in which the solution of the problem is to be looked for is not yet apparent.

In dealing with another difficulty—the proper monochromatic rendering of colored objects—we have made much greater progress. No marked advance, however, has been made since last year, and the general adoption of orthochromatic methods is impeded by the facts that their successful employment, especially for outdoor work, necessitates certain modifications in well-established methods of working; that the preparation of the plates involves some manipulative skill and acquaintance with the selective sensitizers to be used; that it is not at all improbable that a sensitizer with a similar name, but of greatly inferior power, will be used unless great care is taken in purchasing the materials; that the commercial products upon which many have to depend do not at present represent the maximum possibilities of the methods. Nor is this true only of this country. Examination of many reproductions of pictures shows that some continental workers have not obtained complete mastery over the capabilities of the processes, even for the particular class of work in which their advantages were most quickly recognized. The whole question of color, physical and physiological, scientific and artistic, is very complex and difficult. Accurate knowledge and conceptions are comparatively recent acquisitions, and it is therefore not surprising that in the practical treatment of its various problems progress is somewhat slow.

Development and developers have, as usual, attracted much attention. Eikonogen has gradually obtained a firm hold as a useful addition to our developing reagents, its special value lying in the fact that it enables us to obtain well-gradated negatives, where other developers would be very liable to give excessively strong contrasts. It follows that in dealing with very short exposures eikonogen is of the greatest service. In portraiture also it gives very fine results.

Catechol or pyrocatechin has not been fully investigated, partly on account of its high price. Quite recently Dr. W. H. Perkin, Jr., has described a ready method of preparing it from guaiacol, an allied substance much lower in price. In this connection it is interesting to note that Colonel Waterhouse has recently shown that guaiacol itself is a developer, though it does not possess any exceptional powers.

One very important fact in connection with the principles of development has been established by Mr. Lyonel Clark in the course of his elaborate experi-

ments on different developers, and has been confirmed by later experiments of my own, made for quite another purpose. It is that the maximum sensitiveness that a plate will show, in other words, the maximum detail obtainable for a given exposure, is the same for all developers, and for all variations in the composition of one and the same developer. Different developers differ, however, very considerably in the time required to make the maximum detail visible, and it follows, of course, that the gradations of the resulting negatives are very different. That, in a word, is the difference between different developers—a difference in gradation and not in the maximum detail obtainable, provided that the action of the developer is continued for a sufficient length of time. Recent papers contributed to the Photographic Society by Abney, and to the Society of Chemical Industry by Hurter and Driffield, are worthy of careful study in connection with the question of development.

Photo-mechanical printing processes have made no remarkable new departure, but their applications continue to increase. Cheap illustrated papers, and a great increase in the number of the illustrations in magazines of all kinds, constitute unmistakable evidence of the usefulness of these processes. Without photo-mechanical printing a paper like the *Daily Graphic* would be impracticable.

Chromo-typographie, which produces the fine results seen in *Figaro illustré*, and chromo-collotype, which as yet is not often seen in this country, produce results in many respects superior to those of ordinary chromo-lithography. They are at present our furthest advance in the photographic production of colored pictures. Color printing with photogravure, I may perhaps remind you, will reproduce water-color drawings with a fidelity so great that it may deceive even the artist of the original drawing.

The applications of photography to scientific purposes become every day more numerous and varied, and I do not hesitate to say that it is in this direction that photography has won, and probably will win, its greatest triumphs. Here it is without a rival or competitor, and does services which nothing else is capable of doing. As a method of fine art it occupies, and doubtless will always occupy, a subordinate position.

In no branch of science have the photographic results been of greater importance than in astronomy. Mr. Ainslie Common, encouraged by his great successes with his big 3-foot reflector, has constructed and set up in his observatory at Ealing a magnificent 5-foot reflector, in almost every respect the most powerful and most perfect telescope that has ever been made. It was designed and erected especially for photographic work, and its performances will be watched with great interest. You will, I am sure, share my pleasure in knowing that Mr. Common has very kindly promised to give us at our meeting next year an account of the later developments and results of astronomical photography. Mr. Isaac Roberts, with a much smaller reflector (20 inches) at his private observatory at Maghull, Liverpool, has produced some of the most remarkable photographs that have yet been done. Some of these I am fortunate enough to be able to show you, and I would especially call your attention to the wonderful photograph of the great nebula in the constellation Andromeda, which shows that in this nebula we have a new Saturn in the actual process of formation. The condensed central mass, and the system of long oval rings surrounding it, can be very clearly seen. Of the important bearing of this result on the nebular hypothesis I cannot here speak. It must be a source of great satisfaction to all photographers to know that Mr. Roberts' splendid work, like that of Mr. Common before him, has this month been awarded the blue ribbon of science—the Fellowship of the Royal Society.

A very remarkable recent result is Professor Pickering's discovery that a certain star is really a double star with its components too close together to be resolved by telescopes. The discovery was the result of observations on the variation in the definition of photographs of the spectrum of the star.

Mr. Andrew Pringle will tell us that photography has its triumphs in dealing with the minute as well as with the immense, and some of those triumphs he will bring before us during this meeting.

Among other things, photography has been largely and systematically applied to the study of lightning, and by Lieutenant R. Abercromby to the study of clouds and meteorology; by Lord Rayleigh to the study of the effects of electrification on jets of liquid; and by Mr. C. V. Boys to the investigation of falling drops of water. Mr. Friese Greene will describe to us a new form of magazine camera, which he has invented, and which is especially suitable for investigations of the kind to which I have just referred. Last year we heard from Mr. Muybridge himself an account of his wonderful experiments in animal locomotion, and this year Mr. Gambier Bolton is to tell us of the results of his application of photography to the study of animals from quite a different point of view. There is, in fact, no branch of natural science in which photography is not rapidly becoming indispensable.

If the applications of photography to science have been numerous and successful, the same cannot be said of the applications of science to photography. Most of the problems awaiting solution at our last meeting still remain unsolved. The careful experiments of Mr. Chapman Jones have given us accurate knowledge of some aspects of mercurial intensification, but of the real nature of the latent photographic image, of the change which silver compounds undergo when exposed to light, and of many other reactions which underlie some of our most important processes, we are still almost entirely ignorant. The reasons are not very far to seek. The investigators in these subjects throughout the whole world at the present time may almost be counted on the fingers. I say *investigators* designedly; of experimenters of a certain kind we have enough and to spare, but of competent investigators there are very few indeed. The fundamental problems to which I have referred are very complex and difficult, and their investigation requires a knowledge of chemistry and physics much greater than is usually possessed by photographers, and, on the other hand, a better practical acquaintance with photography than competent chemists and physicists usually have. Further, they involve many micro-chemical and electro-chemical changes with which we are at present very imperfectly acquainted. In the less difficult questions of *technique* and processes, the relative merits of different modes of treatment and the like, we might have expected to find more satisfactory progress; but here also we have made no great advances. From time to time, it is true, papers appear in the journals recording so-called experimental investigations of the action of various developers, relative sensitiveness of different plates, and similar matters. In a few instances they leave us just where we were. So far as the advancement of photography is concerned, they represent just so much wasted time and wasted material—wasted because for want of attention to some indispensable conditions—neglect to eliminate important sources of error, want of distinction between several possible causes and the like, no definite conclusions can be drawn from the evidence offered. The enthusiasm of the experimenters is undoubted, and if a thirst for notoriety is not always entirely absent, we may take it that a desire to advance photography is their chief incentive. Why then do their efforts so often lead to nothing? Chiefly from a want of training in the art of experiment; from want of acquaintance with the scientific method. A really good experimenter is a rarity; an accurate observer must be both born and made, and is a still less common species. With very rare exceptions indeed, the scientific method, which includes not only the arts of experiment and observation, but also the power of properly co-ordinating the facts and of making accurate deductions from them, is only to be acquired by careful and long training. Such training, it is a mere truism to say, very few photographers have had; to it, however, we must undoubtedly look for our future progress.

I do not, of course, mean that excellent work cannot be done in photography unless a man has a profound acquaintance with chemistry and physics. I see before me a sufficient number of living examples to at once disprove any such assertion. The scientific method lies not in the matter but in the manner. It would be out of place here to attempt any definitions or illustrations of what the scientific method really is. We might define it negatively as that which is

usually absent in photographic experiments, but that definition would not take us much further. One of the most important characteristics of the scientific method is great reserve and caution in making deductions; one of the chief characteristics of not a few so-called photographic experimenters is a fatal facility for making hasty and incorrect deductions from imperfect data. No stronger proof can be found of the fact that photography is comparatively in its infancy, that its fundamental principles are not generally understood, than the rubbish which is sometimes brought before photographic societies in the form of papers—papers which even now and again escape the waste-paper baskets of the photographic journals. This latter catastrophe, of course, only happens when the editor is away on a holiday. Similar productions are characteristic of all crafts or arts which are still carried on largely by rule-of-thumb; they would not be tolerated in societies of a truly scientific character, or in an art which was really carried out on scientific principles.

Photography has an artistic as well as a scientific and technical side, and if I have not unnaturally dealt with the scientific questions first, I do not forget that the majority of photographers regard the artistic aspects as the more important. In the artistic development we may, I venture to think, congratulate ourselves upon steady and well-founded progress. Argument as to whether photography is or is not a method of fine art is no longer necessary. Its place has been taken by discussions, often of an animated kind, between the different schools of photographic artists—naturalistics, naturalists, realists and the like. Very few who are competent to deal with the matter now refuse to admit that in the hands of a man of artistic temperament and training, photography may be a method of pictorial fine art just as much as mezzotint or sepia. We shall all admit that the possession of a camera and lens will not make a man an artist, neither will the possession of a palette and a box of paints. It is also true that a very large majority of the photographs which we see are far from having any claim to be regarded as works of art, but is that not also true of the bulk of the paintings which are produced? Fine art, I take it, lies not in the method, but in the use of it; in all cases it is the man, not his medium of expression, that determines the result.

In 1873, Mr. P. G. Hamerton, the well-known art critic and editor of the *Portfolio*, very clearly and tersely summed up the case against the claims of photography to rank as a method of the fine art. “(1.) It is false in local color, putting all the lights and darks of natural coloring out of tune. (2.) It is false in light, not being able to make those subdivisions in the scale which are necessary to attain relative truth. (3.) It is false in perspective, and consequently in proportions and forms. (4.) Its literalness and incapacity for selection and emphasis are antagonistic to the artistic spirit.”

Most of this was true enough seventeen years ago, but we have advanced a little in our knowledge of science and art since then. Falsity in local color has almost disappeared before the development of orthochromatic methods, the principle of which was discovered in the very year in which Mr. Hamerton wrote. Falsity of light arises mainly from the use of plates of unsuitable quality, and from imperfect knowledge of exposure and development on the part of the operator. Falsity in perspective and the proportion of forms is entirely a question of the proper or improper use of lenses, and need not exist at all. Literalness and incapacity for selection and emphasis are defects in the photographer more than in photography. How far we have advanced in this direction I will bring to witness, if not Mr. Hamerton himself, at any rate Mr. Hamerton's paper. In the January number of this year, speaking of the photographs which illustrate Miss Agnes Giberne's book, “The Ocean of Air,” the *Portfolio* says: “But what it concerns us to observe is that though they are merely literal transcripts from nature and no artistic faculty than that of selection has been exercised in their production, this faculty alone has sufficed in several instances to prove genuine works of art. If an artist were to take, for instance, the ‘Trees in a Mist,’ photographed by Mr. Sutcliffe, of Whitby, it is not too much to say that he would find it difficult to improve the composition or to alter a single line for the better.”

In their assault on the fortress of art, photographers have already carried the barbican, and many may be found in the outer ward. A few have even forced their way into the inner court, but the keep remains in the hands of the painters and sculptors, and in their hands, I doubt not, it always will remain. Every method of fine art has its limitations, and in the case of photography these limitations are in many respects more severe than in any other method. I, for one, accept Mr. Ruskin's dictum, that every true work of art shows distinctly the method by which it has been produced, and that its character and possibilities are largely determined by the method. I have little sympathy with those whose chief anxiety seems to be to make their photographs look like something else. I believe that if photography is to maintain the position it has already won, and is to make further advances as a method of fine art, we must not only be fully acquainted with and make the most of its capabilities, but we must also quite clearly recognize its limitations. We must be content to admit that there are certain classes of subjects which come rightly within the scope of the painter, but are unfit for treatment by photography. In our appreciation of a picture we cannot forget the method by which it has been produced; and when, for example, you see a photograph professedly of an incident which took place before photography was invented, the unreality and want of truth is too prominent. You are unable to rid your mind of the idea that, after all, it is only a literal representation of a group of models. When, too, we see photographs which profess to represent those human emotions which we commonly hold sacred from intrusion, a sense of unfitness more than counterbalances any pleasure arising out of mere technical artistic skill. All this has been pointed out before, more appropriately, and with much greater force, by the *doyen* of photographic artists, Mr. H. P. Robinson. Latterly in America they have very largely developed the practice of photographic competitions, prizes being given for the best set of photographs illustrating some poem or part of a poem or story; and to some extent the practice has unfortunately, like the potato beetle, spread to this country. If the subjects are properly chosen, with due regard to time and place, such competitions may not do any harm, though it is contrary to experience to expect that any real fine art will be developed in such a manner; but when the outcome is photographs of such scenes as a girl in agony by the deathbed of her father, done, of course, with the help of models—to take only one example out of those which you may see in the American magazines—it is an outrage upon one's sense of the fitness of things.

Even where groups of figure studies of the class to which I am referring are successful, the result is often due to the models quite as much as to the photographer. He has to be content with the best he can make of them; he cannot with his camera alter lines and expressions as a painter can with his brush. In the hands of a few masters pictures of this kind are undoubtedly often successful, but in the greater number of instances they are not at all pleasing to any one but the photographer and the models, and sometimes not even to the models. I hold that in the interests of photography as a method of fine art it is to be regretted that photographers do not chiefly confine themselves to the classes and subjects that photography can deal with excellently, instead of striving after effects and results which, from the essential limitations of the method, are a severe strain on its capabilities. What class of subjects, you may ask, do I regard as proper to photography from the artistic point of view? I would reply, portraiture pure and simple, with studies of figures in costume and groups, if you like, provided that they are put forward as such; landscape and seascape, in which figures are either subordinate or absent altogether. At the risk of making invidious distinctions I would cite Wellington's "Eventide," Mayland's "There is Sorrow on the Sea," Gale's "Sleepy Hollow," many of the studies of Sutcliffe, and many of the landscapes of Green, as examples of the class of work which seem to me to show photography at its best. Some one may raise the old objection that in dealing with pure landscape and seascape you have not sufficient human interest; you can only represent the literal beauty of your subject, and have no opportunity for the idealization which some hold, though

others do not, to be essential to all fine art. I decline to accept the dogma, but even if it were true I would reply in the words of Fra Filippo Lippi :

“ If you get simple beauty, and naught else,
You get about the best thing God invents ;
That's somewhat ; and you'll find the soul you have missed
Within yourself when you return Him thanks.”

What can be done to promote the advance of photography, scientific and artistic? The development of a desire for better training, and the provision of means to satisfy the desire. Here, as in many educational matters, we are behind our continental competitors. Germany has long had an efficient school at Berlin, under Professor H. W. Vogel, and there is a well-known school of a more technical character at Schloss Grönenbach, under the direction of Herr W. Crönenberg. Zurich has a new photographic laboratory full to overflowing. Austria has its new and splendid Photographic Institute, with abundant accommodation, and a large staff of teachers under the direction of Professor Eder, and they attract students not only from all parts of the Continent, but also from England and America. Here in this country we have the schools at the Polytechnic and the Birkbeck Institute, and in various science and university colleges up and down the country instruction is given in the principles and practice of photography, but all of them together are scarcely equal to the Institute at Vienna, and they confine their attentions almost exclusively to teaching, doing but little in the way of research. In America they are not even so well off as we are. So far as I can learn there is only one school of any importance, that at Chataqua, and I am informed, on very good authority, that very little desire is shown to take advantage of the instruction offered, and that the school is only kept alive by the energy and self denial of its teachers.

It has been proposed to found a photographic institute in this country, and we shall all be agreed that, founded on a right basis and conducted on right lines, it might be of incalculable benefit to photography. Founded on a right basis and conducted on right lines—that is the essence of the whole matter, so far as possible success is concerned. An institute of photography, I take it, should teach and examine and conduct original research. It might possibly also act as a court of arbitration in disputes involving technical matters, but the advancement of photography in all its branches and aspects, by teaching and research, should be its chief business. It should be thoroughly, though not ambitiously, equipped ; it must be free from connection with commercial interests of any kind ; above all, it must be free from the immaturism which so often clings round present-day amateurism.

Whether, when all these conditions were fulfilled, it would attract a satisfactory number of students is a matter of conjecture. We English are slow to avail ourselves of our advantages in matters educational, even where the knowledge to be acquired has a direct monetary value. The experience of existing schools is not altogether encouraging, but the prestige which would attach from the beginning to a properly equipped institution especially devoted to photography would probably do much. The standard of every-day requirements in photography is gradually being raised, and there is little doubt that better instruction will be necessary to produce and maintain the higher degree of skill demanded. One thing is certain, that when the establishment of such an institution comes within the sphere of practical politics, the members of the Photographic Convention will not be backward in their support of it.

After all, the real progress of photography depends no more on institutes any more than the progress of civilization and human knowledge depend on acts of parliament. The welfare of a community depends on the conduct and character of the individuals composing it ; and the progress of an art or craft depends on the skill, the thoroughness, the enthusiasm of the individuals who practice it. We as a convention are banded together to advance the interests of photography and all that appertains thereto. As a convention we are endeavoring to justify our existence, and in some measure, at least, we are succeeding ; but whatever we may do as a body, we have each an individual respon-

sibility, an individual duty towards the art which we practice : to see to it that our own work, be it much or be it little, is honest and thorough, the best that it is in us to do. Am I not right in holding that the spirit which should animate every follower of the photographic art is the spirit which inspired the poet when he wrote—

“ In after days, when grasses high
O'er-top the stone where I shall lie,
Though ill or well the world adjust
My slender claim to honest dust,
I shall not question or reply.

“ I shall not see the morning sky ;
I shall not hear the night wind sigh ;
I shall be mute, as all men must,
In after days !

“ But yet, now living, fain were I
That some one then should testify,
Saying — ‘ He held his pen in trust,
To Art, not serving shame or lust,’
Will none ?—Then let my memory die
In after days !”

AMATEURS AND PROFESSIONALS.

BY W. ADCOCK.

[Read at the Camera Club.]

My theme this evening is a delicate one. It is one upon which, as it affects many interests, great difference of opinion may prevail. It has given rise to some heartburnings expressed, and to more in that state of smoulder which readily bursts to flame. We may congratulate ourselves upon not being here to legislate. We are here to discuss only; to look only at the different sides of our subject; and seeing the difficulty of formulating rules for guidance, end by appealing to the best elements of our nature, to follow our bent as amateurs with as much pleasure to ourselves as possible, and with as little possible harm to others, whose interests may be in jeopardy.

I am invited to open for discussion the subject of amateurism, and ask how it affects the trade? In doing this, I have no intention of defining the status of an amateur, or of considering what justifies, or what ignores, a claim to the title. Personally, I have abstained from ever receiving one penny in any shape whatever for aught I have done; and if to-night I promulgate the notion that an amateur does well to put work in the way of the trader when he can, I hope you will give me credit for consistency in pursuing a practice which I preach.

It is alleged that the amateur supplies a want which limits the demand upon the trader; that he photographs places, people and things so extensively, that the action of one multiplied by the many (the immense army now enrolled) makes the demand upon the professional trader a fraction of what it used to be or otherwise would be. It is further alleged that an influence adverse to the trader is exercised by promulgating false ideas of the cost of photography to him, and that by this is engendered in the minds of the public notions of enormous profits and unreasonable charges.

It is alleged that, with the best intentions of doing service to charitable objects, we adversely affect the trader by indiscriminate gifts, and thereby greatly intensify the sections of complaint already alluded to.

Are these three heads sufficient for our discourse and commentary, or shall we seek more? To me they seem to embrace the subject.

The first is a wide one. Amateurs do so much photography there is too little required of the trader.

Shall we inquire what may be taken as a general description of the professional said to be damaged? Good premises in leading thoroughfares, and therefore not lightly rented, are essential to their business. These sometimes supply residences as well, but not unfrequently (I take it) the cost of separate residence has to be added. We see a principal and a manager, both good operators, good retouchers, and all-round photographers. A couple of girls to retouch and spot, a couple more to print, tone, fix, and a boy or two. Here, as far as I can judge, with a reception room and attendant added, is the ordinary staff of many hundred businesses.

It will be evident to any one these employees should have constant occupation—that to pay they should be within the limit of requirement—and that variations from a normal condition should come in the form of extra push of business.

A business with the surroundings of rent, rates, taxes, wages, gives scope for easy calculation of outgoings. With wages regularly incurred, the employment in earning them should be regular. It has become the complaint of the trader we call a professional that employment has become so irregular and so reduced as to make it difficult to keep special people for special work; that the staff would often be unemployed if not employed on comparatively unproductive work; and that this result has sprung up from the action of amateurism. I honestly say my sympathies in this matter are with the trader. To me it seems certain that fewer commissions are being offered to him, and that the difficulties of profitably conducting his business increase year by year.

The surroundings of one's own life sometimes affect one's opinions. It may be that mine are influenced in favor of the photographer, said to be threatened by the amateur, by incessant opposition to my own business and the stigma attaching to those who follow it. For nearly forty years until ten days ago I was a brewer, and either the discovery of Sir Wilfrid Lawson that lords are made specially to smash them up, or for some other potent reason, I have retired from the "traffic" he with such intolerance denounces. During a somewhat long life I have had to do with a few lords, and my estimate of them leads me to think them fitted for far nobler objects in life than some to which the *protégé* of Sir Wilfrid Lawson devotes himself. Beyond the fact that weekly is published a figure of a gentleman carrying a "detective" (and apparently about to steal a shot at a near object said to be "grand"), which certainly, both in face and figure resembles the lord in question, I have no reason to think he is connected with photography; but should he ever become an amateur, I hope he will be more tolerant of our professional brethren than he seems likely to be to my late brethren of the bung.

(To be continued.)

THE CONVENTION.

As has been said, "there is but one New York," so it may be said there is but one Washington, and the selection of our National Capital as the place of our next meeting was a good one, for a more beautiful city could not have been chosen, nor one in which there centers more of interest to the American. In the first place it is the Capital of the greatest Republic on earth, and the place of all places the true American desires to see. The city is designed and built on a scale commensurate with our country, and would do credit to any nation.

We can only note a few of its many attractions. The Capitol—a building of the Corinthian order—situated on a plateau on the eastern bank of the Potomac, forms the center of the city. It has a very commanding position, and is of imposing appearance and beauty. It covers an area of three and one-half acres,

and is surmounted by a dome of iron 288 feet high. It is built of Potomac free-stone and marble at a cost of \$15,000,000, and contains a valuable collection of statuary and paintings costing over \$700,000, beside many other things of value and interest.

Next, the Monument, located near the center of the National Park, is the highest stone structure in the world, and second only to the Eiffel Tower. Built of Maryland marble, 55 feet square at its base, it reaches an altitude of 555 feet; by means of an elevator or stairs a view can be had from the top of the entire city and surrounding country, a sight well worth the trip. On the inner wall, at the stair landings, are memorial tablets from the States and Territories, foreign nations, municipalities, civic, academic and religious societies, all vying with each other to do honor to a great name. While we attempt to grasp and measure it in its massiveness and silent grandeur, we are led to exclaim: "What a fitting tribute from a great nation to its father!" We dare but mention the many public places of interest: The Army and Navy buildings, Treasury, Executive Mansion, Pension and Patent offices, Smithsonian and National Museum—a world of wonders in itself; the Corcoran Art Gallery—whose contents are said to be worth from \$300,000 to \$400,000; the Agricultural, Printing and Engraving, etc., each of particular interest to the visitor.

This much for Washington with its beautiful streets, avenues, buildings, residences, and hundreds of acres of parks and drives. It surely is a desirable place to assemble in. We are endeavoring to make the Convention of 1890 one long to be remembered with feelings of pride and pleasure. One of its most important features will be the Art Criticisms on Photography. Appreciating our need of a better art education, we have had contributed for this purpose pictures made by our leading men both east and west, to be reproduced on the screen, so as to be studied and criticised (on their merits and demerits) by an able art critic and lecturer. This, we think, cannot fail to be instructive and enjoyable. We have also arranged for some practical talks by practical men; these to take the form of short papers (to be followed by discussions) on the following subjects, viz.: the handling and treatment of sitters; posing and composition, lighting, accessories, exposure, developing, retouching, albumen, bromide, platinum and aristo printing, orthochromatic photography, and artificial lighting. These talks will be short and to the point, and helpful.

The great event of the Convention, and one that should interest every disciple of Daguerre, is the unveiling of the monument to his memory. This handsome piece of granite and bronze, a work of art unique and appropriate, was designed and modeled by the sculptor, Mr. J. Scott Hartley, of New York, one of America's leading artists, and is a tribute of respect from American photographers to the Frenchman who originated our beautiful art. This memorial, standing 16 feet high, will be placed in front of the Smithsonian building and unveiled the last day of the Convention. The ceremonies should be participated in by every photographer in the land.

The name of all donors, the Constitution of the Association, and proceedings relating thereto, with other matters of interest, are to be placed in the corner-stone; so send along your dollar at once, and then come and see it done. We shall aim to have present all the veterans of our art in this country to grace the occasion. Don't fail to be there, as it will be one of the events in the history of photography.

The stock and art departments will be very attractive this year. The indications are that we shall have the finest art exhibition ever shown to the public.

The subjects for illustrations and awards are unequaled. Our aim has been to make this exhibition and Convention more attractive and instructive than any former one, hoping to awaken a deeper interest in photography and inspire to greater achievements, which is the prime object of the Photographers' Association of America. Do you desire this? If so, come and bring your friend and neighbor; bring your knowledge and financial aid, and lay them on the altar of photography, that yourself and others may be benefited.

Following is the list of awards, also hotel and railroad rates:

List of awards for 1890 are as follows: The grand prize will be a group in bronze, entitled "Nearing the Goal," value \$225. Governed by the following rules and regulations:

Competitors for this award shall exhibit three plain photographs, illustrating Tennyson's poem, "Enoch Arden," the pictures not to be less than 13 or more than 22 inches in length.

The pictures must be framed, either with or without glass. The award to be made for the most meritorious collection.

Class A.—A beautiful silver "plaque" mounted in plush, representing "Victory," for the best exhibit of genre photographs. The subjects are to be chosen by the photographer and appropriately inscribed; size not less than 13 or more than 22 inches in length, and framed, with or without glass. The award to be made for the best collection.

Class B.—One gold, one silver and one bronze medal for the best collection of portrait photography, size 14 x 17 inches or larger.

Class C.—One gold, one silver and one bronze medal for the best collection of portrait photography, size 11 x 14 inches or smaller.

Class D.—One gold, one silver and one bronze medal for the best collection of landscape photographs; one silver and one bronze medal for the best collection of marine views; one silver and one bronze medal for the best collection of architectural views.

Class E.—One silver and one bronze medal for the six most artistically retouched negatives, any size; prints made before and after retouching to be exhibited with the negatives.

Class F.—One silver and one bronze medal for the six best plain enlargements, either in silver, bromide, albumen, carbon or platinum, size not less than 18 x 22 inches.

Class G.—One silver medal for the best improvement in photographic appliances introduced since the last Convention.

Class H.—One gold, one silver and one bronze medal for the best foreign exhibits of portrait photography, framed or unframed, but delivered to the association free from all charges. Exhibits of this class will be admitted to the United States free, by sending the same directed to the Secretary of the Photographers' Association of America, Washington, D. C.

Applications for space must be made to George H. Hastings, 147 Tremont street, Boston, Mass., who will forward blanks for entries and all needful information.

The headquarters of the Executive Committee will be at the Ebbitt House, rates \$2.50 to \$3 per day. The Arlington, Riggs and Willard, \$3 per day; the National and Metropolitan, \$2.50 per day; the St. James (European plan), \$1 per day for rooms.

All the Railroad Traffic Associations make the rate of a fare and one-third, certificate plan, your local agent furnishing the certificate. By paying full fare going you are entitled to one-third fare returning, if your certificate has been signed by our Railroad Committee, W. V. Ranger.

N. B.—See that your certificate is signed by yourself and local agent before starting.

We shall be most happy to see you at Washington, August 12th.

Fraternally yours,

J. M. APPLETON.

OUR ILLUSTRATION.

THE photogravure with which we illustrate this issue of the BULLETIN is a reproduction of one of Barnard's best efforts in interpreting in black and white one of those remarkable pictures of English low life that Dickens so loved to write about. It is full of the atmosphere of London life along the Thames Docks. The figure of Rogue Riderhood is of a type that was well marked in the days of twenty-five years ago, and as a study in character is well worthy of attention.

ANTHONY'S PRIZES FOR BROMIDES AND PHOTOGRAPHS FROM NEGATIVES MADE UPON CLIMAX FILMS.

OUR publishers offer the following prizes in competition at the Washington Convention of the Photographers' Association of America, August 12th to the 15th inclusive, 1890, as follows:

1. For the best collection of Plain Enlargements upon Anthony's Bromide Paper, at least six in number, and not smaller than 11 x 14 inches, \$100.
2. For the best Crayon Worked Enlargements on Anthony's Bromide Paper, at least three in number, and not smaller than 11 x 14 inches, \$50.
3. For the best exhibit of Landscape Photographs from negatives made upon Anthony's Climax Films, not less than twelve in number nor smaller than 5 x 7 photographs, the negatives to become the property of E. & H. T. Anthony & Co., \$50.

Competitors must forward their exhibits, prepaid, so that they will reach Washington, D. C., by August 10, 1890.

Prints may be framed or not, at the option of the exhibitor.

Each package must contain a sealed letter stating the name and address of the exhibitor and his private mark outside, a letter being also sent to our publishers with same private mark only; but on no account must any other than the private mark appear on the pictures themselves. Instruction as to the class in which they are entered must also be given, and the pictures numbered on the back to correspond with the number given in the class entry. Judgment will be given to the distinguishing mark, but the awards will be announced with both mark and name.

Be sure and ship your exhibits in good time, as those arriving late will not be apt to get a good place, and will run the risk of not getting there in time to be entered for competition.

All exhibits will be subject to the Association rules. All art exhibits must be sent to George H. Hastings, Art Department Photographers' Association of America, Washington, D. C. All charges prepaid.

AIR BRUSH PRIZES.

THE management of the Air Brush Manufacturing Company, Rockford, Ill., offer two air brushes as premiums at the Photographic Convention, to be held in Washington, D. C., next month—one for the best water colors, and one for the best black and white work to be done by the air brush and exhibited there. Mr. L. Walkup (the patentee of the air brush) expects to be in attendance to meet all who may be interested in the air brush, and who want to know what it can do and what others are doing with it.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.O.S.
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

POSTAL PHOTOGRAPHIC CLUB.

MEMBERS contribute ninety-three pictures to the June album. The largest number of prints so far exhibited equals in quality any yet shown by the Club. A well-chosen November road scene from Dr. Strout is leading the monthly voting. Of F. A. Jackson's three platinotypes, a picturesque Connecticut farm house (1650) is one of the gems in the album. J. C. Cole has two charming glimpses of the new "Old South Church," Boston, in form of book illustrations. Max Hanseman shows sepia platinum work of superior quality from negatives that speak well for the new Vogel orthochromatic plate.

R. Dultch brings his first contribution, two studies of children, composed with much naturalness, of play-time and doll days. The Club's Secretary, Dr. J. Max Muller, West Chester, Pa., reports the membership to lack but two of its maximum, thirty, and that it is in a most flourishing condition.

THE BOSTON CAMERA CLUB.

At a meeting of the Boston Camera Club, held on May 3th, the ex-Chairman of the Entertainment Committee reported that there

would be from six to eight illustrated lectures in the hands of the Club for circulation during the season of 1890-91, and that the different societies that have prepared the same have required "Boston" to arrange the circuits.

After considering the report the Club voted to create the office of Manager of the Interchange of Illustrated Subjects; that the office should continue until such time as the societies contributing sets of slides see fit, by united action, to appoint a manager more centrally located.

Mr. William Garrison Reed was subsequently elected Manager, with power to appoint an assistant; Mr. Wilbur C. Brown has been selected for that position.

Circular letters in regard to the illustrated lectures available for next season will soon be issued, and all correspondence in regard to the same should hereafter be addressed to Mr. William Garrison Reed, Manager, 25 Kilby street, Boston, Mass.

EDWARD F. WILDER, *Secretary.*

CALIFORNIA CAMERA CLUB.

THE California Camera Club entertained an audience of some 1,700 people in Odd Fellow's Hall, San Francisco, on Friday evening, June 27, 1890, with a lantern slide exhibition entitled "Through Japan with a Camera." The slides were from negatives made and collected by that enthusiastic and popular amateur photographer, Dr. Edward H. Williams, of the Baldwin Locomotive Works of Philadelphia, who kindly loaned them to the Club. The slides are highly colored and are beautiful specimens of photographic skill, both as regards technique and quality. The collection embraces some three hundred slides, of which one hundred and fifty were exhibited, covering every phase of Japanese scenery and the characteristics peculiar to her people.

Long before 8 o'clock standing room was at a premium, the large audience filling every available space in the hall.

The entertainment was opened with an overture—selections from Mikado—by Blum's orchestra. President George W. Reed welcomed the audience with a few well chosen and happy remarks, and introduced Dr. C. H. Steele, the lecturer of the evening. Dr. Steele's travels in Japan some years ago gave him an opportunity to study the Japanese people and their characteristics, and these studies proved highly interesting and instructive as slide after slide was thrown upon the screen.

The lecturer was a very pleasant and disinterested talker, finding many opportunities to recite witty reminiscences that kept the audience in continued laughter.

After every thirty slides were exhibited the lights were turned up, to rest the audience, and to admit the late comers, who were not permitted to enter the Hall while the slides were being exhibited. Blum's Orchestra discoursed Mikado during these intermissions.

The Club intends giving at least one such public exhibition every month, and trusts, by this means, to keep photography prominently before the public. WM. H. MCCARTHY,

Corresponding Sec'y.

(From the London Times.)

AN AUTOMATIC PORTRAIT MACHINE.

THE latest development of the penny automatic delivery box is a machine for taking portraits, which will shortly be competing in railway stations and other public places with the sweetmeat and cigarette boxes. A private view of this ingenious piece of mechanism was given yesterday at the works of Messrs. Salter & Co., spring balance manufacturers, West Bromwich, and was attended by a large number of scientific experts. The machine is in the form of a large square box mounted on a hollow pedestal. On the front center is a small lens, surmounted by a mirror; a slot for pence is in the top left-hand corner, while a smaller slot for halfpence, in the opposite corner, is for the supply of brass folding frames for the mounting of the photographs. The person to be photographed takes his stand in front of the lens, with his back to a post or rail fixed at a distance of three feet from the machine, and adjusts himself so that his full face shall be reflected in the mirror. With his left hand he then puts a penny in the slot, and remains motionless for five seconds, when the sound of a bell announces that the impression is complete. In forty seconds more the finished photograph, on a metal plate, drops through the delivery hole on to a small shelf, and the process is complete. An extra half-penny will procure a suitable frame, but this luxury is optional. The impressions resemble those of the cheap glass positive photographs, only that tin-plate is substituted for glass. The mechanism is at present a secret, but the principal appears to be that of a rotary arm, which carries the plate through a series of chemical baths till the impression is developed and fixed. There were a few hitches yesterday, which were accounted for by the improvised character of the arrangements, but the results appeared to give satisfaction to the great majority of the persons who tested the powers of the machine. It is understood that a company will be formed to work the invention.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—D. H. H. writes: Can you give a formula that will take out a brown pyro stain from a negative? Also, is there any known method that will keep a pyro developer from turning brown when kept on a plate in development for two hours in short exposure instantaneous work, or is the best method to change the developer one or more times as often as it becomes slightly colored?

A.—To take brown stains from a pyro-stained negative use a nearly saturated solution of alum containing about 1 dram of muriatic acid in 32 ounces. We think it would be better to change the bath after it becomes somewhat discolored, or use a dipping bath with tight-fitting top.

Q.—J. S. W. writes: I am having a lot of trouble on account of blisters. Will you please inform me how to prevent it?

A.—Use a weak hypo bath, 1 in 20, and take longer to fix, and also use a salt bath before fixing. Of course you must keep the solutions at a cool temperature, say not over 70 degrees Fahr., and have them all uniform in temperature.

Q.—W. H. B. writes: I would like you to give me a receipt to make a paste for mounting photographs that will not thin down and become sour in warm weather. Or is there any article or articles that I may add to common starch paste that will give the desired results?

A.—You may use salicylic acid, say 10 grains to a pint of paste, and thoroughly mix. This will keep the paste many weeks, but not indefinitely; we know of no method of doing so.

Q.—A. C. J. writes: Please give me a formula for clearing negatives from yellow stains. I do not know whether it is the sulphite or the sal soda. Could I mix the sulphite and soda and add pyro when I wish to use the developer?

A.—See answer to D. H. H. above. You can mix the sulphite of soda and the sal soda in the right proportions, and add the pyro to a given quantity of the mixture as you need it for use. Take care that the pyro is all dissolved before you begin to develop,

otherwise the plate will be covered with black specks from undissolved particles of pyro in the mixture.

Q.—C. St. J. McK. writes: Would you kindly give me through "What Our Friends Would Like to Know," the relative speed of Vogel's new eoside of silver plates compared with Cramer lightning; or about what number Cramer scale they are?

A.—Eoside plates take about one-third more time than Cramer and other rapid plates. They are probably about 35 degrees on Cramer's scale.

Q.—B. & M. write: We note in your last BULLETIN, page 357, a mention of a new direct gelatine photo-mechanical printing process by Balaguy, of France. Will this process be published, or can you oblige us with the address of the patentee?

A.—The process is said to be a kind of photo-lithographic method, using gelatino-bromide of silver coated upon a gelatine base which is bichromated. By this means the gelatine is made more sensitive to light, and the bromide of silver produces reticulation. After insolation and washing the print may be inked up without first drying. M. Balaguy can be addressed, care of M. Leon Vidal, Rue Scheffer 7 à Passy, Paris.

Views Caught with the Drop Shutter.

A COMPANY called "The Automatic Photograph Company, Limited," has been organized to purchase the letters patent for a machine for taking and delivering photographs.

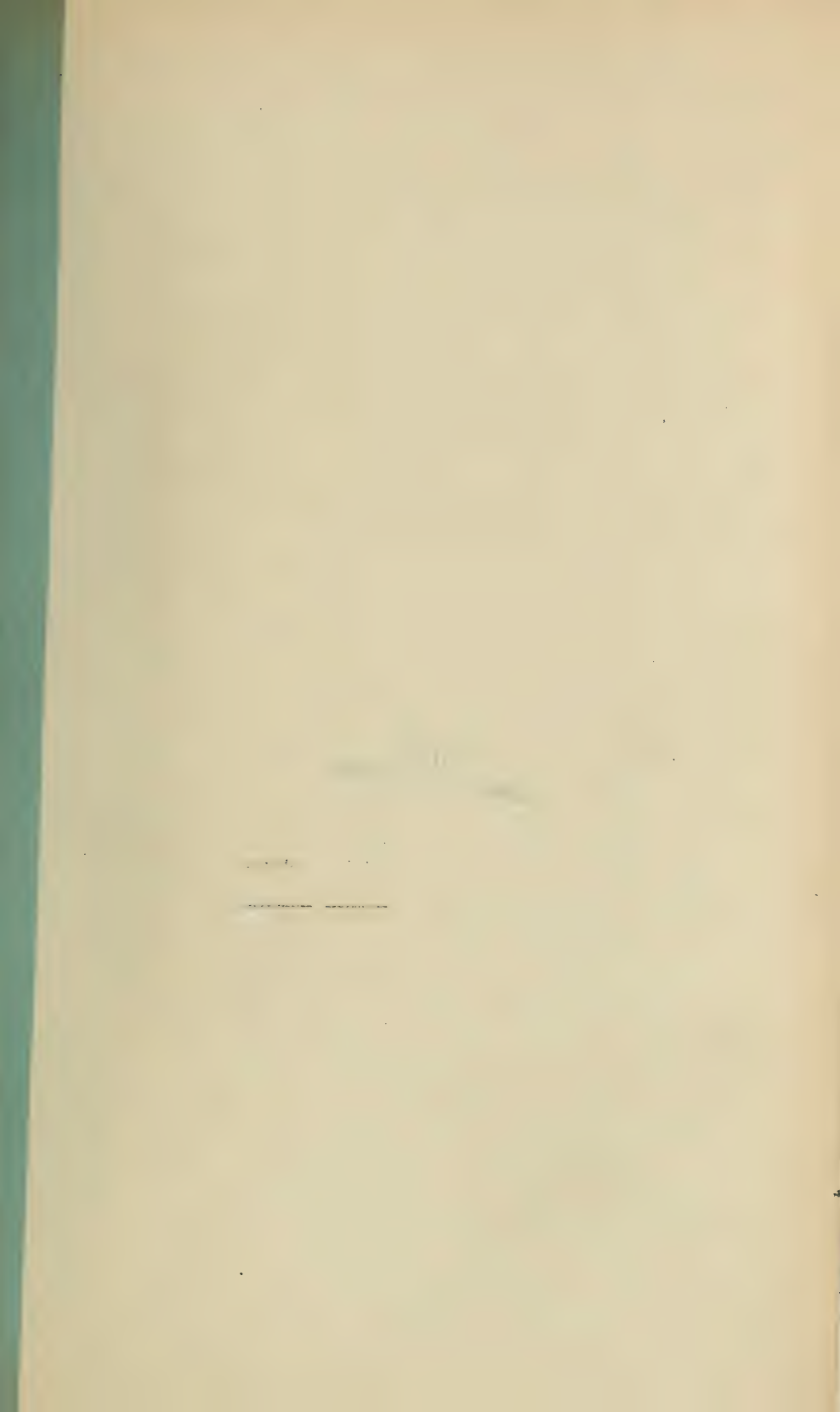
FROM Mr. S. R. STODDARD, of Glens Falls, N. Y., we have received a copy of the *twentieth* edition of his well-known guide to Lake George, Lake Champlain and Saratoga. As usual these are the best of their kind. We note quite a number of additions and a number of new photo-mechanical views. Numerous small cuts made from photographs, distributed throughout the book, show the mountains in outline, villages and locations of hotels as seen from the steamers in passing through the two lakes, giving all notable objects, numbered and named so that the tourists can recognize them readily; with the addition of twenty new pages of descriptive matter and information concerning hotels, boarding-houses and camps of the island section of Lake Champlain. New map of Lake Champlain from Whitehall to the head of Missisquoi Bay in Canada, on a scale of $2\frac{1}{2}$ miles to the inch, including map of Lake George on the same scale, a map of the Richelieu River, and a number of small charts of railroad lines and distances from points of departure to noted cities, and from the various "Gateways" into the Adirondacks. Those who summer in the lovely regions that this guide describes will find it indispensable.

Mr. J. A. FRENCH, the well-known photographer of Keene, N. H., sends us a handsome album of views of that picturesque locality, called "Keene Illustrated." It contains 60 illustrations reproduced by lithography and well finished. All interested in Keene, or that part of New Hampshire, should possess this series of views.

SWEET, WALLACH & Co., of Chicago, write us that we were mistaken about their recent improvements. Their new quarters on State street cover a space 160 feet deep and 60 feet front, not 100 x 40. They also have the best elevator service, and dark rooms for the use of patrons and visitors, lighted by electricity. We are glad to make the correction.

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NEGATIVE BY G. M. ANDERSON

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FRONTIER TYPES.

ANTHONY'S Photographic Bulletin.

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AUGUST 9, 1890.

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WEIGHTS AND MEASURES.

OUR English cousins at the recent convention at Chester made another effort to induce photographers to adopt a rational system of weights and measures. For this purpose a committee was appointed consisting of William Bedford, of the Photographic Club; A. Cowan, A. Haddon, A. Levy, A. Pringle, G. Watmough Webster and Professor C. H. Bothamley. A copy of their report lies before us and it is an interesting contribution to photographic literature.

After a number of preliminary observations as to the present confusion of weights used by photographers, the following recommendations are given:

A. *Weights and Measures.*—1. If the metric system be used, weights will naturally be expressed in grams, and measures in cubic centimeters.

2. If the English units be used, the minim and the dram should not be employed at all. All weights should be expressed either in grains or decimal parts of a grain, or in ounces and fractions of an ounce; all measures in fluid grains, or in fluid ounces and fractions of a fluid ounce.

B. *Formulas.*—3. Formulas should give the number of parts of the constituents, by weight or measure, to be contained in some definite number of parts, by measure, of the solution. The mixture can then be made up with (a) grams and cubic centimeters, or (b) grains and fluid grains, or (c) ounces and fluid ounces, according to the unit selected.

4. The standard temperature for making up solutions should be 15 degrees C. or 62 degrees Fahr. No appreciable error will be introduced by the fact that these two temperatures are not quite identical.

5. Formulas should give the quantities of the constituents to be contained in x parts of the finished solution, and not in the quantities to be dissolved in x parts of the solvent. When a solid dissolves in a liquid, or when two liquids are mixed, the volume of the solution or mixture is, as a rule, not equal to the sum of the volumes of its constituents. The expansion or contraction varies with the nature of the solids and liquids and the proportions in which they are brought together. In making up a solution, therefore, the constituents should first be dissolved in a quantity of the solvent smaller than the required volume of the finished mixture, and after solution is complete, the liquid, cooled if necessary to the ordinary temperature, made up to the specified volume by addition of a further quantity of the solvent.

6. It is very important to specify in the case of liquids whether parts by weight or parts by measure are intended. The equivalence between weight and

measure only holds good in the case of water and liquids of the same specific gravity ; a fluid ounce of ammonia solution or of ether weighs less than an ounce ; a fluid ounce of strong sulphuric acid weighs nearly two ounces.

7. Whenever possible, formulas should give the quantities of the constituents required to make up 10, 100, or 1,000 parts of the solution.

8. When a mixture (*e. g.*, a developer) is to be prepared just before use from two or more separate solutions, it is desirable that the proportions in which the separate solutions have to be mixed should be as simple as possible ; *e. g.*, 1 to 1, 1 to 2, 1 to 3, 1 to 10.

9. When metric units are employed the original French spelling "gramme," should be used in preference to the contracted spelling "gram," in order to avoid misreading and misprinting as "grain."

These recommendations are exceedingly simple, and well worthy of trial by all intelligent photographers. The metric system is most assuredly the best to use, since measures and weights in this system can be purchased from any manufacturer of chemical apparatus, and the more enterprising of the photographic merchants. These weights and measures are just as cheap as those made upon the old system, notwithstanding any statement to the contrary. We have before us a price-list of metric weights in which a set, 20 grams to $\frac{1}{100}$ of a gram, is marked at less than \$2. These would be used for all small quantities. For larger quantities, up to 1,000 grams, a set of iron weights are listed at \$1.25. Therefore, by the investment of \$3.25 for weights, and not more than the same amount for measures for cubic centimeters, every possible contingency in the metric system would be met. This part of the recommendations given above we entirely agree with, but the use of ounces and grains is to our minds a delusion and a snare, and only tends to complicate a decimal system. If you get a set of weights on the grain system you would need a set of measures on the same system, and these are not easily obtained. If you use ounces and follow the decimal system weights of decimal parts of ounces would be necessary, and the corresponding fluid measures. At the present time decimal fractions of ounces and fluid ounces are unknown to us. We therefore protest most emphatically against the adoption of any such system. The metric system is so simple that we cannot believe there is a living photographer who is not intelligent enough to use it. All that has to be remembered is that 1 gram of water measures 1 cubic centimeter, and that these are multiplied and divided by tens. It seems to us almost impossible to conceive anything more simple. The difficulty has been, as we have said on a previous occasion, that writers on this subject have tended to complicate the system as far as weights and measures are concerned by introducing a lot of terms that are valueless, and serve only as an exhibition of their knowledge of Latin and Greek prefixes. The beauty of the metric system to all those who have used it is that the measures and weights are expressed in cubic centimeters and grams, and that the subdivisions are decimal. If we were to write for a week we could not add anything to this, and the mere statement teaches the metric system. All that is necessary to carry it out is to buy the weights and measures and use them; they are infinitely easier to manage than any other system yet devised.

The use of the metric system has become so important and is so simple that the Committee of Revision of the United States Pharmacopœia have decided to introduce it into the next edition of that important volume, which is now under

consideration. This has been done after the mature deliberations of hundreds of physicians and druggists in the United States who recently met in Washington, D. C., to consider the revision of the United States Pharmacopœia. It will therefore be essential for every druggist to understand the system, and surely photographers may readily do so.

The other recommendations in the English report we heartily indorse. We would call special attention to paragraphs 5 and 6. It is extremely important to make solutions containing a definite number of parts of chemical *in* a given volume and not parts added *to* such volume. The use of correct terms either in weight or measure for liquids heavier or lighter than water is also often neglected.

We hope that the time is near at hand when, 20 grains = 1 scruple; 3 scruples = 1 dram; eight drams = 1 ounce; 16 ounces = 1 pound; with the fluid measures 60 minims = 1 dram; 8 drams = 1 ounce; 16 ounces = 1 pint—will be things of the past. How different the metric system, 1 cubic centimeter of water = 1 grain.

EDITORIAL NOTES.

Dr. R. KRUGNER writes: "It is very well-known to me that eikonogen has the displeasing quality of turning sometimes to a dark color; but this is of no importance against the other excellent qualities of the product, if the discoloring takes place only on the surface of the crystals, and if the interior of them rests unaltered, which is the case generally. By testing, you will find the above confirmed. It is not known with certainty by what the discoloring is caused, but you can be assured that the best is being done to prevent it."

WE learn from the gentleman in charge that everything is progressing beautifully toward the success of what will doubtless prove one of the most enjoyable Conventions ever held by the Photographers' Association of America, in Washington next week. The various prizes are almost ready at this writing, and will probably excel all previous efforts. The programme, which is a very full one, will, if carried out as arranged, be prolific of great good. It includes, among other things, an address to the people by Hon. J. W. Noble, Secretary of the Interior, at the unveiling of the Daguerre Monument, and an excursion to Mount Vernon or some other point of interest down the Potomac by boat on Saturday, the 16th; we hope for a full and enthusiastic attendance.

MR. J. S. LENT, of Penn Yan, N. Y., in writing a most hearty "good word" for the BULLETIN takes occasion to inclose two photos of child-life, which are most creditable to any photographer, both subjects being treated in an artistic and feeling manner. We thank him for both.

THE Photographic Society of Great Britain propose holding their forthcoming annual exhibition in London, from the 29th of September next to the 12th of November, at the Gallery of the Royal Society of Painters in Water Colors, full particulars and information concerning which may be obtained from the Assistant Secretary, Edward Cocking, 5 A., Pall Mall East, S. W., London.

AN interesting account comes to us from one of our exchanges, of a recent test made in England, of Anthony's climax negative films, which was conducted

by Messrs. Hurter & Driffield, of Liverpool, to ascertain the relative rapidity of action of these films—(they having recently been placed on the English market). The speed was with a newly invented instrument, and was found to be three hundred and fourteen times as great as that of a wet collodion plate. Our exchange proceeds to say that this test confirms their theory and experience that emulsion on celluloid is more rapid than the same emulsion on glass, which they believe to be due to the fact that the “mat” surface and greater opacity of the celluloid renders it capable of absorbing a greater amount of light than glass.

WE have received a copy of the Constitution and By-Laws, together with a list of the officers and members of the Richmond (Va.) Camera Club, recently instituted, by which it would seem that photography was in a fine state of progression in that part of the South. We wish the new Club success.

A SUBJECT of great interest to photographers was treated of before the Academy of Sciences at Paris, on 23d June, by M. Guntz, who read a paper on the sub-fluoride of silver. The existence of this salt was indicated by the analysis of a precipitate produced on the negative pole, on the subjection of a hot, saturated solution of silver fluoride to electrolysis, with the aid of a very strong current and silver electrodes. By heating finely divided silver, with a saturated solution of silver fluoride on a bath, to a temperature of from 50 to 90 degrees C., the pure salt may be obtained plentifully, which, on analysis, proves to be the sub-fluoride of silver Ag_2F .

MR. S. S. WHEELER, of Pittsfield, Mass., sends us some fine specimens of portraiture and posing, and one in particular of a child, which is not only original and effective in composition but excellent in detail and technicality.

AND still another process has recently been discovered by which photographs may be obtained on glass or paper, which retain the colors and tints of the original from a deep red, through yellow, to bright blue, but with the exception of green, which is absent entirely. A very long exposure is said to be necessary for this result.

WE gather from the tone of our various exchanges that the number of tourists abroad this summer who are actively interested in photography has never been equaled, and we note with pleasure the warm welcome that seems to be accorded them almost everywhere. Most of the leading foreign societies and clubs are offering the use of their dark rooms and accessories to visiting Americans, and the country is being largely reciprocated on this side. Many of the larger and not a few of the less extensive summer hotels are being or have been equipped with dark rooms for their guests, and the tourist photographer is finding much more pleasure and convenience at his command than ever before.

WE must beg to be excused if we take a small amount of pride in the reviews which appear in the foreign periodicals on the third volume of the “International Annual” for 1890-91, and just to demonstrate that our pride is pardonable, we would quote two items. *Photography*, under date of July 10th, after a column of detailed description and complimentary allusions, concludes

by saying: "It is by far the best of the three volumes which have been issued, and forms the cheapest two shilling's worth ever offered to the photographic public." The "Amateur Photographer" of July 4th says: "Anthony's 'International Annual' has just arrived in England and proves to be the finest volume of this nature ever issued by any publisher." The BULLETIN's pride is purely of the parental nature, as it will be remembered that the full title of this work is "The International Annual of Anthony's Photographic Bulletin."

RULES were adopted for the carrying on of the New England Lantern Slide Exchange, at a recent meeting, which provide for the exchange of slides $3\frac{1}{4} \times 4$ among the clubs belonging, and limiting the membership to twelve New England clubs. The Providence Camera Club is to act as Secretary of the Exchange for the ensuing year.

OUR German scientific friends have lately paid a great deal of attention to the meteorological phenomena known as "night shining clouds," and experiments have been made by Herr O. Jesse, aided by several assistants, by which photographs of these clouds have been obtained from different points, several miles distant from each other, and by which it has been demonstrated that they exist at a height of at least sixty miles from the earth. It is evident that their illumination is due to reflected light. The height attained by these clouds is something quite remarkable and their composition a matter of conjecture as yet, since the highest altitude reached heretofore by clouds of this nature (Cirrus) was supposed not to exceed ten miles.

THE St. Louis Camera Club entertained its many friends on the occasion of its nineteenth exhibition of slides, last month, the whole entertainment being of a high quality.

ONE of the latest fads in the jewelry line is the photographing of miniature portraits on silver and gold watchcases and like articles, and burning in the image in such a manner as to render it indestructible. This is a very tasty adornment, and is, beside, the outcome of a woman's effort.

IT has been suggested by one of our exchanges, and with much sense too, that the optical lantern, now so much in use, might find an excellent field for practical application for use by scene painters who have heretofore been obliged to enlarge their sketches by mechanical means which at best have been slow and laborious; by the adoption of the lantern a sketch might readily be projected on the canvas and the effect studied in positive before wasting time or effort as heretofore. Our only wonder is that we do not know of its having been done up to this time.

THE uses of celluloid seem to be increasing almost daily, and particularly in connection with photography and kindred arts; it is now being used considerably as the basis of photographic reproductions by the photo-mechanical processes and is peculiarly adapted to such work, owing to the ease with which it lends itself to retouching, and artist work either with brush, pencil or pen. Its employment in this field will doubtless expand rapidly and permanently.

SOME EXPERIENCE.

IN our old "copy books" we used to write something about "experience teaches." Ever since I have had a modest gallery of my own, now many years, I have found that copy book statement very true. I have attempted as far as possible to let experience teach me, and I have not been particular in regard to who furnished it. Indeed some of my most valuable lessons have been paid for out of other people's pockets. I learned that it is not safe to try new and untried methods in one's regular line of work. This was paid for by an old friend of mine years ago. He was doing a large and prosperous business, which I am glad to say has doubled many times since then. We often laugh over the incident now when talking of new methods and their working in practice. It was no laughing matter at that time, however.

Some one gave my friend a new formula for a silvering solution. It was said to be better than any of those in use at the time, giving richer tones, printing more quickly, and being in every way a great improvement. I have forgotten just what the formula was, but remember that there was a pretty large proportion of glycerine in it. I was much interested and would have made up a bath, but the one in use was new and was working well. After much discussion he decided to try the thing, and made up his solution, using a little over 15 pounds of silver for the purpose. It was a pretty costly bath, for silver was at a premium, and the bill was something over \$250. How he worked on that solution! It would silver the paper all right, but it would strip the albumen from the paper every time. We studied over the matter, but that did not prevent the bath from becoming loaded with albumen. Working with it was quite out of the question. The next thing was to make a new bath and save the silver in the old. He made the new bath after his old formula, and went to work to boil down the one that had given so much trouble. A gas-stove—Bunsen—and a big evaporating dish worked very well. He had filled up for the last time and left dish and burner in charge of one of the family, while we went down town together. When we came back an hour or so later we met fire-engines near the place and found on going in that there had been a fire with a tremendous blaze. The solution had suddenly blazed up furiously. Every one was frightened, and they had to send out an alarm, for the whole place was likely to go. The firemen made short work of it.

The next question was where was the silver? Had it gone up in smoke or down into the ground in the water. Flooring and shelves were charred, the dish burned. As it did not appear that much water had been used, we hoped that in the ashes, the dirt, or the floor some of the silver could be found. But not a trace of silver could the assayer find in anything that was sent, and he had samples of boards, dirt, shelves and flooring.

It was fortunate for me that I did not have to pay the piper on that occasion. It would have made me bankrupt. But I learned the lesson just as well. I resolved that I would not make large experiments unless I had the money to pay for their failure.

But I danced once and paid my own piper in a smaller way not long after. I thought I could practice a little economy. I bought a lot of Anthony's cotton, but saw a chance to make something on the ether and did so. In fact I got the latter article at a considerable discount. I went ahead with my colloid, but it turned out acid, and I had no end of trouble. I got hot in the

collar and went up to headquarters one day and asked for Mr. Henry Anthony. There I proceeded to say what I thought of that cotton. I was pretty cross, and my pocket had suffered a little at just the time when I expected to make something. My work was hindered and I was far from happy. Mr. Anthony was not excited. He rather sympathized with such troubles, cooled me off a little and got at a good many more of the facts than I intended he should. Then he suggested testing things, and in the end I had to confess to the quality of that ether. I had honestly supposed the cotton was at fault, but when I took back a sample of ether which he gave me, and turned out from the cotton a collodion with which I could not honestly find any fault, I was willing to "own up" the next time I met him. Though I had let my red-haired temper blaze up like a roman candle, he was good-natured about it, and when I confessed, smilingly suggested that if I got caught again it would be with my eyes open. I did not get caught on that dodge again.

There is another "racket," as Roche would say, that I stumbled upon the other day. A small dealer was in my place the other day, and among other things said he would like my Atwood alcohol bottles. Would buy them if I did not want them. I was sweet, for I thought I might pick up an idea or get some experience free. So I did it. It seems that he got the bottles when he could, and then went and had them filled with common alcohol. Said it was just as good, cost less, etc. He was rather bitter on the Anthonys, because "they were so stiff." Would not fill the bottles with common stuff. But he had other places where he could get all he wanted, where people were not so particular. He was very pleasant, let out a number of his little secrets, and promised to come around and see me later. Thought we could do something together. But I didn't sell him any empty Atwood bottles. I didn't have any just then—to sell.

One of my friends a while ago thought he could do a nice thing by taking some iodide of ammonia which was offered to him at a low rate. It was "away below Anthony's figures," and he said he thought it was just as good. Perhaps it was, but I heard a good many of his complaints, and it looked to me as though his iodide cost him fully 50 per cent. more than the market price of the best article that money will buy. His saving, supposing he had got a good article, was not quite worth the risk.

Some little time ago I undertook to make some blue prints for an engineer. Business was very slack with me for some time last year, and anything was welcome. I tried the ordinary blue paper that the engineering supply houses sell. But my customer wanted something better, as his work was fine, and so I began to prepare my own paper. This was easy work at first. Then I had a flat failure. I spoiled sheet after sheet, and as the paper was of a fine quality the matter began to look serious. I was buying experience and was paying too much for it. I went through every step of the process and failed to find the trouble. I spoiled four quires of paper experimenting, and then sent for a new lot of chemicals from the house of your publishers. I made good paper after that, but I am puzzled to know where my trouble lay. I knew the old ferri-cyanide was impure and not fit to use, and yet I made some good paper with it. But I also know that the same dirty stuff cost me all the profit on the job. All I have to show for my work is a pile of paper that will not print with three weeks' exposure to a bright sun, and a large addition to my experience. The latter I put down as so much capital.

Four years ago a dry plate maker who is now a neighbor of mine had an experience that cost him every cent he had in the world. When he began business again, it was on the ground floor. He knows more about chemistry than he did then, and a deal more about selling dry plates. It is generally understood around here that he was pinched a little by competition, but was making money fast. His plates had a fine reputation, and he was holding the market against an opposition firm, as they were cutting a little on quality.

The good plates that he was making were pretty costly, and he was trying to meet a small break in prices. With a manufacturer's instinct he began to buy close on the raw materials. I think his first investment was in some bromides which he got far below the American market. There was enough in it to make the temptation a strong one. It was a trap and he walked into it. The emulsions fell off in quality as the new stock replaced the old. The plates did not keep. Batch after batch of emulsion was spoiled. And while this was going on there was some tinkering with a cheaper grade of gelatine. Before he could recover the quality, the plates in the market showed every fault a plate could have. They came back from every dealer and from every user. He had simply to take them in and return the money and stop.

He sometimes sends me a few boxes of plates that are not quite up to the standard, but of one thing I am pretty certain: it is not the fault of the chemicals.

I said I did not make a mistake again about collodion. But hypo took me in last fall. The offer of a cask at $1\frac{1}{2}$ cents was too much for me. I was nearly out; the sample was a little dirty, but the hypo was pure. The price was lower than I had ever paid. I cannot complain of that hypo. It was cheap and good. But that dirt came high. I think we made the same kind every time we swept the floors. Of course I filtered the stuff. It is such a pleasure to filter hypo. But I did hate to pay for that dirt. It was such "ornary" dirt. It would go through a filter like distilled water. I would not have cared if the cask had been filled half-and-half. But it was three pounds of dirt and two of hypo. But then I was perhaps a little prejudiced. I do not want common, cheap, dirty hypo. I am paying market prices for the best article I can find.

I would like to preach a little sermon about some card stock that came into our town two years ago, and about which the local photographers are grumbling yet, but I am afraid you have had enough from a

SMALL GALLERY.

[From *Photographisches Wochenblatt*.]

MINIATURE PHOTOGRAPHS.

(Continued.)

BY DR. A. MIETHE.

THE development is made with a concentrated gallic acid solution, to which is added a few drops ($\frac{1}{2}$ to 1 per cent.) of nitrate of silver solution, consisting of:

Nitrate of silver.....	1 gram.
Citric acid.....	1 "
Water.....	100 c.c.

In about fifteen minutes the development will be effected, and is interrupted when the small pictures, held against the light and examined through a glass,

appear to be entirely covered. Some practice will here easily lead to uniform results. The fixing and toning is done in the following bath :

Chloride of gold.....	0.1 gram.
Chalk.....	4 grams.
Water	100 cc.

The tone of these pictures will then be purple-brown to black.

But no matter how handsome the results of this process are, even if exercised with some practice—the grain is not visible, even if one hundred and fifty times enlarged, and the lights are quite clear glass—it is inconvenient in its execution, particularly in a laboratory which is arranged for dry plates. I have taken pains, therefore, to discover a bromide of silver gelatine process which is simpler and leads to equally good results. After continued experiments I succeeded by employing the practical experience of Mr. Gaedicke. In this manner, which I will describe here, pictures can be obtained without any difficulty which resemble the albumen pictures in every respect, and besides have the advantage that the sensitiveness of the preparation is about sixty times as great as that of the albumen collodion.

We will pass now to the production of grainless bromide of silver emulsion plates, which, according to my experience, deserve great preference for our purpose in comparison with the albumen plates, for reason of their convenience and sensitiveness. The whole process can be executed so easily that every one with a little practice will obtain faultless results after a short trial.

At first I will describe the production of the emulsion, where nothing is to be observed with particular care except proper temperature. The gelatine used for our process must be pretty soft, having a rather low congealing point. Nelson's soft gelatine has given me uniform and good results. A sample is made to swell, melted at low temperature, and by slowly cooling off a 5 per cent. solution, the congealing temperature is measured, that is, the moment when the thin liquid solution commences to gelatinize ; this temperature should not be too high for the gelatine to be applied. The solution should also not act alkaline. Four grams of bromide of potassium are dissolved in 50 c.c. of distilled water in a small flask, and 5.2 grams nitrate of silver in 50 c.c. of water in another vessel, and this is tested with litmus paper. The solution must have a weakly acid reaction, and is acidified eventually by a minimum of nitric acid ; 7.5 grams of gelatine are then soaked in cold water, over which is poured for half an hour a 5 per cent. soda solution ; the gelatine is then washed thoroughly, whereby the test can be made with litmus paper, that the water has no longer an alkaline reaction, and the whole is then melted in so much water that the solution will come to 100 c.c. Left now to cool off to 31 degrees C., the quantity is divided into two halves, and to the one is added the bromide of potassium solution, which previously had been brought to a temperature of from 31 to 35 degrees C. The other half is left to cool off to 28 degrees C., and the silver solution is added quickly. Both parts are now mixed at once, pouring, in yellow light, the silver gelatine in a thin stream into the bromide gelatine under continued stirring. If left standing for some time red fog in the emulsion will form. At this low temperature, and without the presence of an alkali, no emulsion will form, but a light red and opalescent liquid, which will coagulate quickly on a porcelain dish. The mass remains now closed light-tight for thirty-six hours in a moderately warm place, is then cut into small pieces, made

into threads through a piece of coarse canvas under ice water, and is then washed; 1,500 c.c. water each are now poured upon the threads five times at intervals of twenty minutes, and the emulsion is stirred from time to time. It is now left to drip upon clean linen and is melted carefully in a water-bath of 32 degrees C. for filtration, which is executed twice in a warmed filter through a chamois skin. In this operation fine bubbles have formed, which by prolonged standing of the mass at a temperature of 28 to 32 degrees C., are passed to the surface and then removed with a piece of white filtering paper. When the process has reached this point the separation of a very finely divided bromide of silver has to be caused by carefully adding diluted ammonia, or still better, triethylamin. For this purpose concentrated liquid ammonia or triethylamin solution is diluted with 20 parts of water, and 5 drops of this liquid are added to the mass at a temperature of 28 degrees C. under easy stirring with a glass rod. The formation of the fine bromide of silver results surely when the gelatine commences to show an alkaline reaction, which can easily be proven with litmus paper.

The separation of the bromide of silver and the consequent bleaching of the emulsion suffers sometimes delay before it is effected. But there is no necessity to wait for this, for it can be poured at once upon the plates, which should be warm. The emulsion, poured on pretty thinly, must show a pure light pink color tone; if gray-yellow, gray-red or brownish, it is proof that the bromide of silver grains are not of equal size. Such an emulsion does not give good results.

(To be continued.)

(From the British Journal of Photography.)

THE ART OF RETOUCHING.

BY REDMOND BARRETT.

CHAPTER V.—THE FACE: AN EXHAUSTLESS STUDY.

As it is for the treatment of the face principally that the negative is placed in the retoucher's hands, too much cannot be said about it. The whole success, as well as the beauty of the picture, may be truthfully said to depend upon its skillful manipulation. This being so, it is to be hoped that no apology will be necessary for my entering, more or less minutely, into the various details which bear upon the proper treatment of the face. We can solace ourselves with the thought that this, once mastered, the most important branch of the art of retouching is acquired, and all other details are easy of accomplishment. It is to be hoped that the reader will not become weary of the description, or be induced to pass hurriedly or negligently over these observations, as no points will be touched upon but those of absolute importance, and which will prove of value to the beginner in his studies.

As the pupil will easily understand, every face will require a special treatment for itself, from the fact (so wonderful and so easy of discovery) that no two faces are exactly alike. By this must not be understood that an entire and exhaustive study of each face is necessary, though such would be no disadvantage, but that each peculiar type or class should receive our special attention.

It will be found a very considerable help if the reader can procure a photograph of some well marked and intellectual head, and try to apply the following

remarks as far as possible to it, and thus help me in the rather difficult task of explanation without the assistance of plates.

The inspection of a well-lighted and, if possible, unretouched photograph of a man, say, about forty to fifty years of age, and features well defined, will show the muscles and lines to be found in almost every face. Although some of these markings will not be so conspicuous in one person as another, these same muscles and lines on close examination will be easily found—facial anatomy being alike in all. The balance of these features is very seldom, if ever, absolutely alike, and is greatly, if not entirely, governed by the mind, health, or disposition of the man. Naturally this fact is more observable in elderly persons, and in men still more so than in women. As one progresses in years, so the markings in the face become more and more defined—the result of natural causes. The young face possesses all the muscles as well as the most aged, but the natural plumpness of youth covers them up and largely hides their expression. As time rolls on, however, we see the traits develop, and the face becomes lined, as influenced by mind, disposition, or health, the movements and contractions to which they are subject accentuating these lines and markings, which constitute the major part of the troubles in the path of the aspiring retoucher.

Let us examine some of the changes that time and other influences may have worked upon the faces of those around us—we need not be too vain to take a quiet look at our own as well. What a study we have before us! In treating this subject it is my intention to eschew all classical phraseology as much as possible, and to content myself with the resources of the mother tongue, and so avoid, as well as I can, becoming in the least abstruse. For the buccinator of the inter-maxillary group, therefore, I propose that jaw may be accepted as more expressive, and we will start by examining the space between the jaws and the circumference of the mouth, and that corresponding with the lower jaw. In youth these muscles are naturally very full and pronounced, but as years roll on the subcutaneous fat wastes away, until in time it entirely disappears. This leaves the outer integument, or skin, having lost its contractibility, to fall in folds or wrinkles so totally different from its form in youth, that all the shape as well as the expression originally belonging to this part of the face becomes completely altered. In some cases this alteration is so great that at the first glance it would seem impossible; for the very shape of the head appears to be quite different. These remarks apply also to that region which may be described as the circumference of the eye, eyebrows, etc., for here, if anything, the changes are still greater than perhaps in any other part of the face.

The furrow running downward from the corner of the nostril toward the mouth becomes very marked when the flesh loses its firmness in the manner just described. These lines must never be totally obliterated; indeed, great judgment should be used in softening them. By softening these lines a person is made to look much younger, as thereby the appearance of loose flesh is considerably subdued and the original formation of the muscles more distinctly indicated. As the true character of the face may become more or less injured, if not altogether destroyed, by this operation, the greatest care and judgment should be employed while retouching these portions of a face. The wrinkles and folds in the skin, which are caused by such contraction of the muscles, run at right angles, or nearly so, to the muscles themselves, as, for example, in the forehead. In a child the frontal depression is scarcely visible, but as he or she

advances in years, and the muscles over the eyes are constantly being contracted, a furrow is gradually formed across the forehead situated just above the nose, and continuing up to between the frontals.

To men whose foreheads become prematurely marked, through either close application to their studies, or physical and mental sufferings, etc., this wrinkle, if not sufficiently softened when retouching the negative, would give a much older appearance to the portrait than was possessed by the original in actual life. This marked difference is traceable to the fact before alluded to, that the light crossing the direction of the wrinkle would greatly accentuate it, and therefore make it appear more deeply set than in nature.

The skillful treatment of this frontal depression, or furrow, in the forehead at the root of the nose may give or take away an expression of grief, pain, or frowning. In some it is only a single furrow, and but slightly marked, but men who are constantly employed in intellectual labors generally have two folds distinctly marked and full of character. At the sides of such folds are what may be described as two small protuberances, or ridges, which in no case should be obliterated; indeed, at times a certain amount of effect may be gained by increasing their size somewhat. We accomplish this by introducing a little light upon them, which imparts additional force. It is a rather delicate experience this, and should only be resorted to in the case of negatives of persons whose eyes are farther apart than the average, and whose foreheads may be low, flat, or receding.

Of course I need not say where the retoucher's standing orders are flattery first and likeness after these remarks do not apply. On the contrary, where flattery is the keynote whereby we regulate our retouching, such markings as the lines between the eyes, over the root of the nose, may be taken away almost entirely, and where the eyebrows may have a square shape, which carries a harsh expression, they may be slightly rounded, but with great discretion. Such treatment is quite usual with ladies' portraits, as any one connected with a fashionable photographer of the present day can testify. It is best, however, that we bear constantly in mind what is the correct thing to do, so that when we are obliged to do what is really wrong we may not be led too far.

The simplest way to carry on this description will be to begin with the forehead and work down the face, just as though we were working a crayon drawing.

The frontal eminences, which are always best as a starting point, are two prominences on the upper part of the forehead or brow. I say two, which is correct, although occasionally the depression separating them, and which helps often to give them their formation, is so slight that they appear as one protuberance. These eminences are often quite as strongly marked in extreme youth as in later years, although in the former the fresh, pulpy condition of the integument may prevent the depression between them being quite so observable. They must be softened and smoothed by very skillful retouching, and made to carry the most pronounced high lights of the face (excepting the judiciously placed high light on the nose). Considerable care must be taken to light them in proper perspective, and thus bestow a greater prominence upon the one nearer the source of light. Placing high lights demands great care and experience, and until fairly proficient the student had much better leave them alone. A head may easily be ruined by fixing the high light to near the center of the forehead, or too high up and close to the hair, and so altering the entire formation of the features.

Rotundity, so essential to a really good portrait, is best preserved by placing the brightest lights in the center of the high lights, and the deepest shadows in the center of shades, and paying the strictest attention never to allow the edge of a light or a shadow to be sharp or too defined. Immediately surrounding these lights a delicate half-tone must be preserved—of course, assuming that the quality of the negative at our disposal will permit.

Having worked up the prominences in the upper part of the forehead and preserved as much of the delicate half-tone around as was possible, we come lower down to the arches over the eyes, or brows, and start working up to another high light, the intensity of which is altogether dependent on the shape of the head under treatment. I have known many cases where the lights on the brows were still more striking than on the frontal eminences at the top of the forehead; so in this treatment the retoucher's judgment must be largely exercised. The skillful working of this portion of a head gives life and form to the eyes. In muscular or very thin people a curved line or crest may be noticed; this must be so subdued by the retoucher as not to catch the eye of the observer, but on no account must it be obliterated.

Whenever the skillful operator may have been able to secure a delicate half-tone on the side of the forehead—where naturally there is a slight hollow—care must be taken to preserve it. All these little markings tend largely toward the production of truly artistic portraiture. The point of the cheek bone must be lightened and led into the cheek, leaving the highest point of light under the eye, and immediately over the highest point of the cheek-bone. As the bone approaches the ear it should be but very slightly worked and made less pronounced, any half-tone being preserved as valuable to the rotundity of the picture. The entrance to the ear may be improved by the placing of a slight light upon the upper edge of the cartilaginous protuberance; of course, ever bearing in mind what has just been laid down about not placing lights too near the edge.

Many times a heavy and strong shadow may be found on the cheek, imparting a strange shape and appearance, for which you cannot account. According to the general lighting of the face it should not be there, nor does the formation of the head generally warrant it. Still there it is, and it is objectionable. To the experienced retoucher it is no worry; he simply takes it away, knowing it is the result of high color, the appearance of which photography falsifies. Red being one of the colors that photography represents as deep in tone as a black coat, any one with what we may term a high color will be sure to suffer until the retoucher makes amends for the libellous treatment received at the innocent hands of the operator.

Having thus worked up the forehead and upper part of the cheek, before going lower see that the frontal depression at the root of the nose be kept subdued, and, if the case will allow, remove the furrows running across the nose. Except in a very characteristic head these markings can be subdued very considerably, although not altogether obliterated. The upper lids of the eyes may be slightly worked upon, but, if so, great caution must be used lest any of the lines formed by the elevation of the lids should be destroyed.

All communications for the columns of the BULLETIN should reach us on Monday preceding the day of issue, to insure their publication at that time.

[From *Photography*.]**PREPARING LINE DRAWINGS FOR REPRODUCTION BY PHOTO-ZINCOGRAPHY.**

BY PROFESSOR W. K. BURTON, C.E.

ADVICE on the matter that we mention above might more appropriately be given to artists than to photographers, as the latter comparatively seldom have to make drawings of the kind indicated, and generally have at least some idea of the requirements when they do. Still photographers have occasionally to make such drawings, and we know well, by experience, that they do not always prepare them as the worker of photo-mechanical processes would wish. In any case it ought to be a matter of interest to photographers to know the conditions that should be fulfilled.

It is true that those who have given much attention to the making of negatives for photo-mechanical line work gain wonderful skill in getting, at least, fairly good results from very unpromising subjects. For example, from old engravings in which the paper is yellow, and the lines by no means a pure black; but the ease and certainty of the process are very greatly increased if the drawing is all that it should be, and when the drawing is especially prepared for the work there is no excuse for increasing the labor and difficulties of the reproducer.

The first thing to be taken into consideration is the color of the paper and the ink, and the surface of the former. It need only be said that the paper, or cardboard, should be of the purest white, or, at any rate, with no tendency to yellowness, and that the ink should be a true black. The surface of the paper should be smooth, but not glossy. What is sold as Bristol board is generally preferred. No one who has not tried it will believe how much the difficulty in getting that absolutely opaque and transparent negative that is wanted for photo-mechanical work is increased, at times, by a very faint yellow shade such as is quite common even in the case of new paper.

As to the ink, there is, we may say, a fixed rule about that. Chinese ink of the best quality only should be used, and it should be ground till it is as thick as will conveniently flow from the pen. Some writing inks do fairly well, but none so well as Chinese ink, and the writing inks sold as "blue-black"—or which are "blue-black"—are especially to be avoided.

All that we have so far written will have been known to at least the great majority of readers. Certain other factors that govern the ease or the reverse with which line reproductions can be made are probably not quite so well known. Thus, few take into consideration that the nature of the drawing should be quite different according as it is to be reproduced of the same size or is to be reduced in size. If the reproduction of the picture is to be of the same size as the original, the lines must be drawn of the exact fineness needed in the print; if the reproduction is to be on a reduced scale, the lines must be fuller than they are to be in the reproduction. This is a statement almost self-evident, but those who have not tried do not generally know how very much—to the eye—broader the lines must be made than they are wished in the print when the reproduction is to be, say, three or four times smaller than the original. Our first experience of preparing drawings for zinc etching was in the making of mechanical drawings that were to be reduced six or seven times, and we were greatly surprised to find how very thick it was necessary to make the lines to

get the effect that we wished. Once really appreciated, the fact that the drawing must be made very boldly, if it is to be considerably reduced, is a great advantage in the case of hand sketches of whatever kind, as it allows a freedom of drawing that is not permissible when the drawing will be reproduced of the same size as the original.

Another thing that needs consideration is the variation in the thickness of the lines. It may be stated as a general rule that the nature of drawing that is most easily reproduced is that in which the lines are all fairly thick, and in which they are all of the same thickness. This is, of course, a condition that could not by any means be imposed upon an artist, but there are many who are capable of producing an effect almost the same to the eye by a few bold strokes of the pen as by a number of fine lines, and an artist, bearing in mind what we have just stated, will often, by giving the matter a little consideration, be able to save the zinc etcher three or four etchings without in the least spoiling the effect that he wishes to produce. As for the fineness of line permissible, it should be borne in mind that what may be called very fairly fine lines can be reproduced, but that the trouble in etching is increased just about in proportion to the fineness of the lines.

It is often quite possible to improve greatly the condition for copying of any print that has to be reproduced. It might be supposed at first sight that common printer's ink is about the most perfect black that could be got, but it will very soon be seen that this is a mistake if we go over a part of any print from an ordinary woodcut with a pen charged with good quality Chinese ink. It will be seen that there is quite a contrast between the treated and untreated lines, and this will be even more evident in a negative made from the print in the camera, especially in those cases where, the paper being somewhat yellow, it is necessary to give as long an exposure as the lines will permit to get density in the whites.

Of course, if a valuable engraving is to be copied, such treatment would not be allowable; but in making reproductions from ordinary engravings or woodcuts, there is often no objection to the practice of going over the lines with a pen, and we have known cases where the paper was pretty yellow, in which this re-inking just made the difference between the possibility and the impracticability of getting a good negative. In some cases the thinner lines may be somewhat thickened with advantage, especially when it is intended to reduce the size of the work; but this is a thing that must, of course, be done only with judgment. Indeed, except in the case of mechanical drawings, and the like, it is a thing that should not be done but by an artist.

We now come to the case of making a line drawing direct from a photograph. It is by this process that a great deal of the pictorial work for the illustrated papers is done, and, even if the photographer have no actual reason to make line drawings in the way that we are about to describe, he will find the working of the process one of the prettiest experiments that he can make.

A photograph is printed lightly by any of the several silver processes. We believe that albumenized paper is generally used, but a smooth mat-surface paper has some advantages. Gelatino-bromide paper may also be used. If albumenized or ordinarily sensitized mat-surface paper be used, the print is neither toned nor fixed. If bromide paper be used it is advisable to fix and fairly wash the print.

A pen is now used with Chinese ink, and the outlines of the subject, and as much shading as is considered necessary, are sketched in. Immediately that the ink is dry the print is placed in a developing dish, and is flooded with a saturated solution of bichloride of mercury. In a few minutes every trace of the photograph will have disappeared, leaving a pen and ink sketch only. It is surprising how quickly, with a little practice, it is possible for any one who is even an indifferent draughtsman to make a very presentable pen and ink sketch that is all ready to be copied in the camera. A practiced hand has no difficulty in making such a sketch very quickly, and so that it needs no after work. A beginner will generally find that the sketch wants a few after touches, and some prefer to put in the outlines only on the photograph, and to shade afterwards. In either of these cases it is necessary to wash, or at least to rinse, the print, and to dry it. Otherwise it may be squeezed on a flat board, and be copied in the camera without drying. It is even possible, if the sketch appear wanting, to make the photograph visible again, so as to aid further work with the pen. All that is necessary is to wash the print, and to flow it with a solution of hyposulphite of soda—the old “magic photograph” dodge—when a more or less distinct image will appear. This is not advisable, however, as the whites are generally degraded, and the copying is thereby made more difficult. It is needless to say that, in the hands of one who is expert and who has any artistic taste, a great deal may be done in the way of emphasizing the principal part of the subject, and in subduing, or entirely omitting, the less important details:

[From The British Journal of Photography.]

ETHICS OF PHOTOGRAPHY AND PHOTOGRAPHERS.

BY J. TRAILL TAYLOR.

(A Communication to the London and Provincial Photographic Association.)

SOME are unkind enough to allege that there is no system of ethics applicable to photographers and photography, unless in the inverse application of the term, and they adduce examples in favor of this negation, to some of which I shall have occasion to allude.

Can photography lie? it has been asked. Can photographers lie? or to put it more plainly, Do photographers lie, and why, or under what circumstances, do they lie? Is it necessary they should, and is it expedient that the strict and severe Temple of Truth be erected in its midst? In the social world strict ethics are largely ostracised; ethics and politeness, popularly so called and practiced, are not invariably in harmony.

In what I say I am not supposed to have reference to photographers as social, private individuals, but merely to them as photographers. In itself photography is but a plastic tool in the hands of those who know how to employ it, and it may be made to subserve good or evil. My present purpose will be served by pointing out certain directions in which deviations from pure ethics are occasionally made by those who handle the camera. In doing so I take no cognizance of departures from accuracy of statement made to serve the exigencies of trade or commerce. Deliberately false or misleading representations do not enter into the topic before me: this being simply falsehood open and palpable. Neither do the tradesmen's arguments to his innocent purchaser that such and such a piece of apparatus is the thing for him to have, because such a one uses

none else, and he has obtained a plethora of medals at exhibitions ; this is humbug. Nor does my category include the one who assures me a lens is ten inches in focus, while measured properly instead of from the posterior end of the brass work it is twelve ; this is ignorance. Nor the tramp who, pointing his camera at a house under pretense of photographing it, secures the money in advance, without having any intention of developing his plate, if plate there was in his camera ; this is fraud. Nor the young Daguerreotypist who, having succeeded in taking one or two fairly good Daguerreotypes, handed his camera over to a more experienced man, after having, unseen, smeared iodine on the shutter of the dark slide, by which his rival failed *in toto* in producing a picture ; this is trickery, and under some circumstances pardonable. Nor the one who rubs powdered nitrate of silver inside the front of the dude's hat at a picnic with ladies when the thermometer is in the nineties ; this is mischief. These, and numerous examples of like nature of departure from the straight path which might be adduced, scarcely come under the heading of mal ethics, although they are not ethical. And yet the line of demarcation is hard to draw.

Nice distinctions may even be drawn between artifice, deception, fraud, charlatanry, empiricism, delusion, white lies and black lies, but they all belong to the same family.

Photography is in itself so absolutely truthful that it is accepted as evidence of realism. The camera merely depicts what is placed before it. But realism is not necessarily, and does not necessarily convey, truth. The large lump of coal placed on a cloth-covered table with a few miniature shrubs and twigs around its base, and then photographed on a large scale to do duty as a scene in the Rocky Mountains or anywhere else, cannot be said to be in accord with ethics if such be done with intent to deceive, even although the trick cannot be discovered by the experienced geologist who examines the perfect strata through his magnifying glass.

A point of sight may be selected for a view which, when aided by a lens of short focus shall give as a result a photograph true as a piece of realism, but conveying the false idea that the duck pond in the foreground is a large lake, and that the shrubs or trees of 6 feet height almost rival the giants in the Mariposa Grove in California. A realistic photograph, while thus geometrically true, may not only fail in conveying a truthful impression, but one the very reverse.

Stepping from nature outside to inside the studio, who has not heard of the two sets of solid furniture—one being in miniature, to be had in use solely when men of Zaccheus-like stature desired that their circumscribed longitude should be elevated into that of mid-stature by contrast with the surrounding tables and chairs. I touch only lightly upon one of the most prevalent of mal ethics in the studio, because it is the outcome of the ignorance of the photographer ; I refer to the two entirely different kinds of perspective to be so often found in one picture—that of the background and side scenes on the one hand, and that of the figure on the other. In a portrait—a standing figure of a lady full length—which was seemingly much admired at a recent exhibition, the point of view of the background was below the knee; that of the figure itself was about opposite her eyes. But some background painters and photographic artists so-called do not appear to think that perspective has anything to do with their art. The amateur who takes his portraits out of doors with natural surroundings never encounters this anomaly ; the perspective of his figure and

background necessarily harmonize, and is it to be wondered at if the educated artist or observer of nature is found to give preference to one over the other?

Artists seem to arrogate to themselves a prescriptive right to improve upon nature. I have heard the late Sir George Harvey, President of the Royal Scottish Academy, speak in approving terms of a local artist who always enlarged the eyes of his subjects when working them up by the brush or pencil; photographs, in the estimation of this gentleman, always made the eyes too small—for artistic taste, I presume. But æsthetic truth and ethical truth are not the same thing, although there are cases in which one may with advantage be made subservient to the other. I heard a famous New York photographer giving directions to his managing printer, who was one morning submitting to him rough proofs from the negatives of the preceding day. “Take a big slice off that lady’s belly” (indicating with a pencil), “and place it on behind. It will much improve her appearance.” And it did so. “But that is not like —,” I remarked of a new portrait of a famous actress since extensively published; “she is rather sour and scraggy, while this one is amiable and somewhat fleshy.” “Oh,” remarked the photographer, “a retoucher has been working a whole day on that face in order to obtain this effect. She doesn’t care whether it is a good likeness or not, so long as we make her good-looking.”

Retouchers! oh, what ethical sins have you not to answer for! You supply all the crudities and deficiencies of nature. At your magic touch strabismus vanishes. Where nature has been unkind in the matter of eyes ’tis yours to supply the required number, and convert monocular into binocular vision; to round the sharp angles of the features by the transference of adipose tissue from where it is not wanted to where it is needed; to fill up the furrows dug by time; to enact the chiropodist upon facial excrescences, and the dentist, in case the taker of the negative has forgotten to stuff cotton wadding pads inside the mouth to insure a pleasant rotundity to the wan cheeks—a thing a New York photographer never omits. You do not believe that the man or woman exists who in his or her heart indorses the sentiment of Oliver Cromwell about being painted with his wrinkles and warts. And you are right. They may assert as much as they like, but you well know such phrase and fact do not coincide, and accordingly you dress your ewe in lamb fashion, taking shelter behind Luther’s dictum, that a great artist portrays a man as he should be, and not necessarily as he is.

(To be continued.)

AMATEURS AND PROFESSIONALS.

BY W. ADCOCK.

(Continued.)

[Read at the Camera Club.]

EXCUSE this digression. Let us look at the next complaint, and inquire if it seems reasonable that the widespread knowledge of photography, as practiced by thousands of people, extends to a general knowledge by outsiders of what our mere materials cost and creates false notions of the charges a trader must make to live by his trade. When a sister inquires, and a brother tells her, the history of the last batch of likenesses he gave pretty Miss Brown, she does not see in it such a strain on his pocket as two years ago she would have thought

the transaction involved. Satisfied herself, she conveys the intelligence to her friends, and it becomes in the family circle accepted as a truism that photography can really be done for an old song. "Charles tells me it costs him less than cricket did; and you know how delighted Kate Jones was with the cabinets he gave her." "Then think of what we paid Tympanum, of Bond street!" Gentlemen, you will deal with this in the discussion I am supposed to be opening. I will only say, in connection with this phase of things, that should my circumstances in life compel me to seek another business, the last I should elect as a paying one would be professional photography.

We come now to the third section of complaint. That the gifts to charitable objects are calculated to aid in their effects the alleged evils we have referred to. Now I see much palliation can be pleaded when injury to private trade is involved with works of charity. In fact, the whole subject we are discussing bristles with difficulty. Notwithstanding we are told the wrong people make the laws, and that they should be made solely by those who possess nothing, we have under them much power of doing as we like. We require no license to photograph away a fortune and give the prints to the winds if we choose to do so. Others could only say: "Don't be so silly; I would not," and not "You shall not."

Then take the case of a man whose means are small and, perhaps, family large. Call him what you like, semi-trader or aught else. He, in time at his command, does some photography to eke out his income. What can we say to him? Of him I do not think the regular trader would complain. He furnishes an otherwise half-empty cupboard by it. He may be forced to cut down price to sell even to his friends. He is a difficulty. If a man gives prints to a bazaar the end seems to justify the means. It is a difficulty. It affects the trader doubtless, yet the difficulty of treating it is present to us. May I say here what, in such a case, is my own practice? Last week a Primitive Methodist minister tapped me for a portrait that would sell at his chapel bazaar. I promised him a dozen. I took the negative. I agreed with a little trader to print and finish them for me, and I fixed the price the minister was to pay that trader for the two dozen more he wanted. They sold at a profit; they did good to the trader.

This leads me to say, I think amateurs do wisely to have as many portraits of themselves and their families from professionals as if they were not amateurs. These portraits are of thorough value, and I strongly urge their procuration. My only child has sat to me dozens of times, but I have portraits of her by eight leading men, and she sat to Caldwell of Nottingham last week, not for the first time by several.

Let us consider the pleasantness of complying with the wish of our friends in taking their portraits if we say yes, I will do so, but I do not print. I will let Mr. — have the negative, and he will sell you copies on fixed terms. Gentlemen, it can be done, it is done. The trader, I feel, deserves our consideration. He is fixed in a business he cannot move from. In hundreds of cases he is that, and to change would be to ruin him. I have ever been handsomely treated by the trader. I respect the class. Let us, in pursuing our fad, do to him much good, little harm as we can. Let us obey the golden rule, Do to others as we would they should do to us.

DISCUSSION.

Mr. Pringle said that in the main he quite agreed with Mr. Adcock's generous view of the matter. He did not think that the disaffection between the

amateur and the professional, said to be now smouldering, would break into a flame. The contention was that the small professional was injured by amateurism in England, and there might be some ground for this, seeing that many who took up photography professionally had evidently mistaken what was required in such a profession. But although amateurs might have the moral and legal right to sell their photographs at bazaars or when and where they liked, he thought they ought to seek to avoid doing more injury than could be helped. His own practice was never to give more than two prints from any negative.

The Hon. Secretary then put before the meeting a letter written by Mr. E. J. Feilden in the "Amateur Photographer," in which several heads of the question were definitely stated.

Mr. Webber thought there was very little ground for complaint, and that the amateur would generally comply with the requirements of the situation. It was altogether out of the question for the amateur to accept money payment.

Dr. Patterson said that if the amateur did better work than the cheap professional, he thought the latter was better out of the way. What was wanted was that we should have the best possible photographs.

Mr. Davison regretted the necessary absence of their genial friend, Mr. Adcock. He thought the question as to what might be admitted as amateur procedure and what constituted a man a professional in photography certainly bristled with difficulties; and, indeed, very rarely did circumstances require or justify any distinction being sought for or made. In clubs it was sometimes thought advisable to bar admission to the professional; but the only good reason which could be found for that restriction really militated most against the admission of the manufacturing or dealing photographer and not at all against the studio professional; whereas, the manufacturers, whether directors of photographic companies or persons more closely responsible for the trade done, were not generally considered as professionals, nor under the strict meaning of the word could they be held to be such. One view of the question was quite clear, and that was in art there could be no amateur and professional, and that led to the subject of distinctions in photographic exhibitions. It was a generally accepted opinion among those who exhibited and understood the best object of such exhibitions, that such a distinction was unnecessary and only led to the multiplication of classes and cheapening of awards.

Mr. Pringle said Mr. Feilden tried to draw a line it was absolutely impossible to draw. He quite approved that there should be no division into amateur and professional classes in exhibitions.

Some discussion took place as to the fairness of admitting work done by a firm of several hands in competition with work done throughout by one exhibitor.

Rev. C. F. Lambert said he would be inclined to eliminate all firm work from exhibitions, and if two or more hands were concerned in the production of the picture, that should be specifically declared.

Mr. Davison said he thought there was no unfairness. Work on one picture by several hands must be more or less of a hotch-potch. The notion that a photograph was improved as a picture by one man selecting and taking it, another developing the plate, a third printing it, and so on, would not hold. If the judges were men capable of seeing anything deeper than superficial finish—ornamental photography, as Mr. Pringle had called it—then it would be the firm work which would justly suffer by comparison.

Mr. England pointed out that at Pall Mall no distinction was found necessary, and the system worked smoothly.

A unanimous vote of those present was taken in favor of there being no distinction in exhibitions.

Some further discussion took place, in which Messrs. Tomlinson, Clift, Clark, and the Chairman took part, and the meeting concluded with a hearty vote of thanks to Mr. Adcock for the paper he had contributed.

A POSSIBLE CASE—A crate full of all sound peaches.

[From Author's Corrected Proofs.]

A NEW DEPARTURE IN SILVER PRINTING.

BY EDWARD A. GOLLEDGE.

WE are constantly having brought under our notice some new dodge in connection with the photographic art, and frequently owe a debt of gratitude to those who are generous enough to give publicity to any new feature that may bring about a certain effect which we have been unable to accomplish after spending both time and money to no small extent.

The following may not be new to some of my readers, but to myself, after a varied and lengthened experience in silver printing, it comes as a great boon, more especially as workers in platinotype may have cause to murmur when they find a large increase in the price of valuable paper, which must certainly affect the pocket of the persevering amateur.

A short time ago I had occasion to interview Mr. Otto Schölzig with reference to his now well-known sensitized paper, who, after having most kindly afforded me the information required, submitted to my notice some samples of paper which had been exposed to light through some colored celluloids; I was struck with the remarkable effect of the various tints obtained by the light acting upon the silver paper after passing through the various colored mediums, more especially as the toned specimens produced totally different effects to that obtained when printed in the ordinary manner. I lost no time in putting the experiment to a severe test, and the result of my experiments in this direction I now desire to place before my readers.

I have tried printing through the following colors: Blue, ruby, orange, yellow and green, and it is really surprising to note the variety of tone that may be secured by the various methods. I shall mention that my aim has been to obtain as pure a black as possible, and my experiments have certainly been rewarded with success far beyond my expectations.

Of all the colors experimented with I find green, yellow and orange give the best results.

Blue glass seems to have very little effect unless it possesses a decided greenish tint. Ruby glass I have discarded altogether for securing a black tone in the finished print, and the very best results are obtained when employing green glass of a somewhat deep color, and printing in direct sunlight. I have not found any marked difference in the effect produced when printing in the shade, and of course the time occupied is much prolonged.

My experiments have been conducted solely with mat surface and other papers, and although they have been carried out in a very hurried manner, I feel convinced that many advantages may be gained by adopting the method referred to.

The appearance of the print before toning is somewhat peculiar, inasmuch as it is in color a beautiful purple brown, a color one is so anxious to obtain, as a print of this description (which I never secured by any other means) is in excellent condition for the toning bath. My difficulties hitherto have been to get other than the brown tint, which color will not tone to the desired black. It would appear to me (not over well acquainted with the chemistry of photography) that the action of the light upon the sensitized paper is similar to that of crystallization. In order to obtain good crystals it is necessary to allow time for

them to form, and the crystals are deposited in certain parts of the vessel only, in bold form. Quickening the process by violent evaporation and we obtain a shapeless mass of small crystals all over the vessel. The printing process appears to be a kind of crystallization, the chlorine of the silver chloride being freed and silver sub-oxide being deposited in a crystallized form. It is acknowledged, also, that slow printing produces better detail than quick printing, but it was not until I had experimented that I had discovered that various colored silver oxides or sub-oxides precipitated under various colored lights had each an entirely different affinity for the gold in the toning bath, and that the one took the deposit of gold rapidly, while the other refused to take it altogether. There is no doubt that the tones obtainable by the method I describe on mat surface paper are quite equal to the best results ever obtained by any of the platinum processes, and it is therefore likely if not certain that a large demand for this paper will be made upon the makers, when it is discovered that such fine results may be had, more especially that its cost is less than half that of platinum while the process offers decidedly more certainty than any of the known platinum processes. Mr. Schölzig is certainly to be congratulated on having been the prime mover in this most important discovery, to improve (if not to perfect) the tones of the silver print both mat as well as albumenized.

In order to get the best effect it is necessary that the paper should be printed very deep in fact so deep that detail in the shadows is quite lost. I have found that in printing from a negative, in which some parts are dense, owing to halation or some other cause, it is necessary to carry on the printing until detail in the densest part appears. This does not appear to affect the other part of the picture, which under ordinary circumstances would be much over-printed; also, when printing from a weak negative, much finer results may be obtained by using the green glass than if printed in direct light. In fact I am of opinion that intensification of negatives will be rendered quite unnecessary, if, when printing, the precaution is taken to print through the green or yellow glass; of course the time occupied in printing is longer, but to my mind this is no drawback to the process. For want of time my experiments have been somewhat limited, but perhaps this may come under the notice of some one who may be able to devote time in experimenting with various tinted glasses. There is certainly a wide field for research.

The after manipulations are much about the same as with ordinary printing, but when using Schölzig's mat surface paper, the prints simply require a rinse in one water before placing in toning bath. I recommend the following toning bath for pure black tones.

Borax.....	1½ drams.
Uranium nitrate.....	4 grains.
Gold.....	3 grains.
Water.....	24 ounces.

Of course if a quantity of prints are to be toned, more gold should be added, but with the bath above given I have toned from 2½ to 3 dozen whole plate prints on Schölzig's mat surface paper. It is necessary to replenish the bath with gold if it becomes weak, and the same solution may be used several times, providing gold has been added.

The tungstate and phosphate bath, as recommended by Mr. Schölzig, gives fine dark tones on the mat surface paper. The time occupied in toning this

paper is but a few minutes. I place the prints into salt and water, and fix in the usual manner.

The enamel and brilliant albumenized papers take longer to tone, and it is as well to wash thoroughly before toning and place in last washing a dram or two of carbonate of soda, tone until all brown has disappeared, when viewed by transmitted light, and place in salt and water and fix in usual manner with a dram or so of ammonia added to the bath. Fine black tones may be obtained by this method, although any range of tone may be had according to fancy.

It is possible some of my readers have already tried the experiment I have endeavored to describe, but to myself it is entirely new.

While conducting my experiments I have found that when using deep ruby glass the time occupied in printing is considerably less than when using yellow or orange. This fact is worth knowing, as it touches upon another branch of photography and will encourage amateurs to use more light in their dark rooms. For my own part I always use 12 inches of orange glass and have developed the most rapid plates in the market without a mishap, but I feel I am encroaching upon another subject which is not my intention. Silver printing with green glass and gold toning is my subject, and I must leave my readers to experiment and judge for themselves.

Since writing the above it occurred to me that the prints toned in the bath with uranium might not be permanent; I therefore placed several of them (mat and albumenized) in a strong solution of nitric acid and water for many hours without the slightest change taking place, proving beyond doubt that the tones obtained are the result of a deposit of gold and therefore permanent.

[From *Photography*.]

PHOTOGRAPHY IN PARIS.—PHOTOGRAPHERS: THEIR STUDIOS AND WORKSHOPS.

C. R. K.

It is scarcely necessary to remark that Paris is a city teeming with photographers, and those, too, of a good high standard average; but having a clear smokeless atmosphere facilitating their operations gives them a clear advantage over London fellow-workers. The renowned Boulevards have for a notable feature the show-cases of Lutetia's best artists—not the spacious shop or "store" windows of London or American cities, but usually shallow cases in the entrance ways answering the same purpose, and these are oftentimes a very slight index to the magnificent work shown in many fine reception rooms.

Of the actual manual operations, contrivances, "kinks" and dodges, the profession abroad learn little through the technical press of France, which, as most readers know, is not composed of the many and thoroughgoing journals of England, or fine "trade-house" publications of America. The reason, undoubtedly, is that everyday workers seldom take up a pen on their business, preferring to leave that to literary photographic men who know well that the national distaste for too much reading does not except the busy photographer. Journals do not care to give much beyond new formulas, scientific essays on chemistry, light, etc., and large chunks from the foreign press, but the least possible information on the commonplace matters referred to. Consequently it is thought that these notes will stop more than a gap, give some suggestive hints,

and show what the most noted of Parisian photographers are doing, and their means and ways of doing it.

Celebrated and popular is the house of Pierre Petit, dating its foundation to 1852. Its business has been one of steady growth, and now takes in Nos. 17, 19 and 23 of Place Cadet, but the entrance to this first of photographer's ateliers is quiet indeed up to the first floor, and there we find a very large business office, while further up is the *atelier de pose*. Note, by the way, the numerous pneumatic balls which the photographic mind couples to electric bells for signaling to any part of the great establishment. Next is an immense room or gallery showing every style of work done here, as well as very large oil paintings on a photographic basis patented by the firm, and called "lincographie." The process has almost superseded carbon for the very best and most expensive work, and naturally the pictures are exact likenesses, but, personally, their magnificent carbon enlargements are preferable. At the end of the long room, and on the left, are "current" negatives—about 375,000—simply placed in racks around a well-warmed room devoted to the purpose. Further along a series of rooms have thousands of negatives stored away in square grooved boxes, and are labeled "horses," "dogs," etc.; human races, according to their picturesque style of nationality; specially-taken clichés of engineering works in every stage of construction—as Eiffel's Tower and Bartholdi's "Liberty Enlightening the World." And next is the room of celebrities—State, Church and Aliens; and, again, negatives from famous paintings. For copying, wet plates have been used, and are preferred, but Ilford where softer prints would suffice. This latter is the brand of plates always used for ordinary work. Upstairs is a large dark room with double glass ruby window not affected by the sun. Oxalate is the developer, because so many plates can be attended to at a time, and development is easily watched, pyro being considered messy and requiring a stronger light, and eikogen, though good, is too slow, and best for amateurs only so far.

Retouching, mounting, spotting, burnishing, etc., are operations carried on in extensive, and in cold weather, well-warmed rooms. Near by is the sensitizing room, strung with lines, over which the paper is hung without clips. The tint prevailing now is Rives' mauve, and the bath used is of 12 per cent. An old disused posing gallery serves as another good retouching room, and, adjoining, is an artists' room for working up the large oil photographs and reproductions from old faded prints by all processes. The dark room is near to the studio, which latter is a pleasant spot, broad, and well lighted by the roof sloping towards the camera. Dallmeyer is M. Petit's best optic, but Voigtlander for outdoor work. A long passage leading off from one side is a sunny place for a lounge, pictures on left, and plants and carbon transparencies against ground-glass windows on right—ottomans, tables, and plush curtains being its furniture. Printing is carried on under and above glass, but without special feature. Just at this moment the Duc d'Orleans sensation has brought in immense orders for copies of his photo, making it lively for commercial photography. Phototypie (collotype) is not utilized, but the apparatus and rooms formerly used in this connection still remain. From printing rooms to cellar is a remote distance, and to the latter the prints come and go into the large baths; acetate toning is, of course, in vogue, and two baths are arranged for first and second wash after fixing. A hose, lying at bottom of tank, is said to be all that can be desired in carrying away the lower and more contaminated water before the

upper level. The tone of prints popular is a little approach to blue. A six-horse gas-engine is in same room, and makes the latter warm above the equable temperature derived by its underground position. The dynamo driven furnishes the light to arc-lamps in the enlarging room just above. This room is partitioned off into a cupboard for the arcs which are ranged about the condenser, and to the other side of the boarding is the camera, slides, etc. The screen for supporting the canvas in this "lincographie" process is mounted on wheels, and runs along on wooden rails for focusing out to about 25 feet, and is about 10 feet square, and strongly built; an adjoining room, lighted solely by a large yellow window, is for sensitizing and developing the canvas prints of any size up to that of the screen, necessitating many enormous trays. Sensitizing is done in V troughs by two operators drawing it through the solution under a glass roller, as one would develop a large platinum print. Each end of the canvas is lightly sewn to a heavy glass rod, and it is thus evenly stretched while hung up to dry on one of the numerous lines about the room. What the sensitive base is is kept a secret, but the weak purple color of a developed print reminds one of silver salts. The stored-up energy of the dynamo is not allowed to waste after a day's work at enlarging, but frames of carbon prints are placed all around the arcs, and thus utilize the light—artificial light being preferred to solar for carbon work. Actinometers are used (compulsorily) only by the more inexperienced; the old hands being able to judge with accuracy by the degrees of gloss on an exposed surface, as viewed by reflected light, the extent to which the half-tones have printed. Carbon prints on opal glass find no demand, although the beauty of them is admitted, and was long since recognized. The carbon prints are developed in the next room, a spacious and lofty old place, fitted with a few large trays and gas water-boiler. Another room, wrecked by the steam, was shown as a former washing-house, but the present one is not by any means a model, in which we always expect to find stone floor, cement walls, varnished wood, or tiled ceiling. The tissue used is the London Autotype Company's, and this, along with certain colors of Monckhoven's, is found to be the best to be obtained commercially—a fact which explains the reason for some noted photographic houses in England finding it necessary and preferable to make their own tissues to avoid blisters and frilling. The successor to M. Pierre Petit is his son, a cheery business-like man of very little past thirty, whose face indicates nothing of the small worries of a large establishment. *Photography's* project met cordial assistance at his hands.

NOTES ON THE REPORT OF THE LENS STANDARD COMMITTEE.

[Read at the Chester Convention.]

BY A. HADDON.

BEFORE submitting the report drawn up by the Lens Standard Committee, I propose to state the history of this committee, and the reasons for the recommendations at which it has arrived.

At the meeting of the convention held in Birmingham, 1888, a committee of five members was appointed, at the suggestion of Mr. W. Taylor (Leicester), "to consider the adoption of the standard lens fittings recommended by the Photographic Society of Great Britain, or to suggest alterations of that system, and to take or indicate such steps as may be considered necessary for its effective

establishment." The committee thus appointed consisted of Messrs. A. Cowan, A. Gifford, A. Haddon, J. H. Pickard, and S. G. B. Wollaston.

That committee met twice during the time which elapsed between the Birmingham and London meetings, and the Chairman (Mr. Wollaston) drew up a report which was submitted to the Council, and it was decided that the same should be read at one of the evening meetings. After the reading of the report Mr. W. Taylor proposed that the report be not adopted, but be referred back to the Committee for further consideration. Mr. Conrad Beck seconded the motion, which was carried.

At a meeting of the Council, held in London on February 21, 1890, the committee was reappointed, consisting of Messrs. A. Cowan and A. Haddon (Mr. Wollaston having previously tendered his resignation as chairman of the committee), with power to add to their number. It was thought advisable to increase the number by adding to the list the names of three gentlemen well known to you, viz., Mr. W. Bedford, Dr. J. Edmunds and Mr. H. M. Hastings, F.C.S.

We discussed the *pros* and *cons* of different methods so as to formulate a system of standards which should be practical and popular, and as we had only the report of the Photographic Society of Great Britain to guide us, we thought it best to consult those gentlemen who are daily engaged in the superintendence of this kind of work. In addition to this, so as to insure a meeting, a few of the leading opticians were called on personally, and their promise to attend obtained.

The Secretary of the Committee made a few remarks on the subject in hand, and then called for any suggestions that any one present might wish to make.

Mr. W. Taylor (Leicester) opened the discussion, and among other things referred at some length to standard gauges to be used in connection with the screwing of lens mounts, and pointed out that whatever system was finally adopted, it was necessary to seriously consider gauges, as, unless these were absolutely true and of the same size to the ten-thousandth part of an inch or even less, the resulting work could not be interchangeable. Mr. Taylor did not mean, as some seem to have inferred, that the lens mounts themselves should all gauge to anything like the one-ten-thousandth part of an inch. It would be impracticable as a manufacturing operation to screw thousands of lens mounts to this degree of accuracy. Mr. Taylor then showed two sets of steel gauges, such as he had devised for his own factory, in order to insure as near constancy as possible in the diameter of the screwed portions of mounts and flanges. He also mentioned that steel gauges for the smaller sizes of lenses did not last more than one year in consequence of the slow but constant wear they underwent during their use. It was impossible to harden them, as during this operation they generally warped to such an extent as to become valueless. He had, however, partly overcome this difficulty by hardening certain removable pieces which could, after the operation, be replaced in exactly the same positions.

In connection with the standard unit for diaphragms Mr. Dallmeyer suggested $f/10$, and mentioned that at the recent Photographic Conference held in Paris $f/10$ had been adopted, so as to introduce the decimal system in connection with diaphragms. He considered his own suggestion better, as in order to obtain the intensity value of the stops it is necessary to square the denominator, and in his case it would only be necessary to strike off one naught, while if the French system were adopted two naughts would have to be struck off in order to obtain the unit area. Your committee agree with Mr. Dallmeyer that the method he has suggested is extremely clear and thoroughly scientific, although there is much to be said for the powers of two. If they were starting a system anew, they might well recommend Mr. Dallmeyer's suggestion for general adoption. But, as against this, they have to take into account the number of diaphragms that have been marked on the $f/4$ system, as recommended by the Photographic Society of Great Britain, and therefore think that it would be unwise to make an alteration now, more especially as the $f/4$ system is at present getting to be well understood and widely used.

Messrs. Debenham and Beck also spoke on this subject, and finally, when the question was put to the vote as to which of the three systems should be recommended for adoption, $\frac{1}{4}$ as the standard unit was carried by a large majority.

The next point for discussion which was raised resulted in a proposition from Mr. Dallmeyer, seconded by Mr. Beck, that a special meeting of opticians be called in order to settle the sizes of the screwed portions of lens mounts and flanges.

The last subject that was brought before the meeting and voted upon on this occasion was screws for attaching cameras to tripods and for fixing rising fronts, etc. As nothing better was suggested than appears in the report of the Photographic Society of Great Britain, this was put to the vote and carried unanimously.

The meeting was then adjourned till the 9th of May.

Prior to the meeting of the 9th of May a circular was drawn up and about 200 copies posted to the different opticians whose names appear in the "London Postal Directory." This circular embodied the different suggestions that had been made, and contained a copy of the resolution proposed by Mr. Dallmeyer and seconded by Mr. Beck. The response to this appeal for data was very meager.

As the meeting of the 9th of May consisted almost exclusively of opticians, and was more or less of a private nature, we need not enter into details, but will only give the results arrived at.

On this occasion between ten and twelve opticians were present. Some data as regards diameters of the screwed portions of the mounts of lenses and numbers or threads to the inch were handed in for tabulation, but these data proved to be only approximate, no attempt having been made in any case to measure accurately the diameters, and the necessity for accurate gauging having been apparently not realized.

On discussing these results it was found that the diameter of the smallest lens mount, where screwed to receive the flange, has been derived from an old gauge prepared by Andrew Ross. This thread has been copied by several younger makers, and it is believed that some 100 to 120,000 lenses of this particular size have been manufactured and are now in use. Upon considering this state of things it was proposed that this size should be adopted in the future. This was carried unanimously. Mr. Dallmeyer thereupon very kindly offered to supply specifications as regards exact diameter, thread form and thread rate for this screw, which was understood to be 1.5 inch in diameter.

The next larger size, 2 inches about, was then discussed, and for the same reasons as given above with regard to size No. 1. This was put to the vote, and carried by a majority (6 for, 2 against). Thereupon Mr. Dallmeyer promised to supply data for this screw also.

It was then proposed that the standards of the Photographic Society of Great Britain, with the above modifications, be accepted. This was lost by three voting for and five against the proposition.

The Photographic Society of Great Britain had kindly lent their standard gauges to one of the gentlemen present, and the gauges were upon the table for examination.

With regard to the form of screw to be adopted in connection with lens mounts, it was proposed and carried that the thread form known as Whitworth should be adopted.

It was then proposed, seconded and carried, that as the present was not a sufficiently large representative meeting, another meeting be called, and that all opticians be invited to send in to the Secretary of the Committee exact measurements of lens mounts and flanges, with their thread rates for all the classes of lenses which they manufacture.

The meeting was then adjourned till the 21st of May.

As soon as possible a second circular was sent out to all opticians, as on the previous occasion, and as a result eight statements were received, and these were tabulated.

From the data thus tabulated it appears that Messrs. Newton & Co., Reynolds & Co., Suter, Taylor, Taylor & Hobson, and the Stereoscopic Company have been for some time past manufacturing lenses in accordance with the specifications of the Photographic Society of Great Britain.

The tabulated results also showed that what had been supposed by Mr. Dallmeyer to be $\frac{1}{8}$ inch gauge, and which had been adopted as one of the standards by the previous meeting, was in reality $\frac{1}{51.3}$ inch. The screw which had been supposed to be a 2 inch also turned out to be 1.98 inch. It also appeared that there was some considerable divergence between these mounts and those issued by the younger houses, who had copied the Andrew Ross mount without access to the Andrew Ross gauge, and now manufactured these screws of such various dimensions that there was no certainty of interchangeability of these so-called 1.5 and 2 inch mounts, among some half-dozen makers, who all considered they were making the same screws. Upon these facts becoming clear the whole subject of the resolution which had been adopted at the last meeting had to be re-opened.

(To be continued.)

THE WASHINGTON CONVENTION.

PROGRAMME.

THE eleventh annual convention of the Photographers' Association of America will be held in the National Museum of the Smithsonian Institution, Washington, D. C., August 12th-15th, inclusive, 1890.

The morning sessions will be devoted to business. Let all matters to be presented be well formulated, that no unnecessary time be consumed.

The afternoons and evenings of the second and third days will be given to "Art criticism" and "Practical talks."

We have prepared a full programme, well calculated to instruct and interest both scientifically and artistically.

There will be something of interest for each one; therefore we desire not only a full attendance, but promptness at the sessions, that the work may move.

We shall open a question drawer on the morning of the second day, questions to be answered at afternoon and evening sessions.

In the afternoon of the fourth day, at 2 P.M., in the Smithsonian Institute, the unveiling ceremonies of the Daguerre Memorial will take place. Forming in ranks at the Ebbitt at 1.30 P.M., the Association, headed by a band, will march to the building, and there proceed to dedicate to the memory of Daguerre the beautiful monument erected for that purpose. The programme is as follows:

PROGRAMME.

FIRST DAY.

MORNING SESSION, 10 A.M.—1st. Calling Convention to order.

2d. Address of Welcome by Mr. R. Dickinson Jewett, of Washington, D. C.

3d. Roll call.

4th. Reading of Minutes of last meeting.

5th. Report of Standing and Special Committees.

6th. Selection of Location for 1891.

7th. Appointment of Committee on Nominations.

8th. Appointment of Committee on Awards.

9th. President's Annual Report.

SECOND DAY.

MORNING SESSION, 10 A.M.—1st. Reading of Communications.
 2d. Report of Committee on Nominations.
 3d. Report of Special Committees.
 4th. Unfinished Business.
 5th. New Business.

AFTERNOON SESSION, 2 P.M.—1st. Posing and Composition.
 2d. Lighting.
 3d. Backgrounds and Accessories.
 4th. Exposure.

Each to be followed by discussions.

EVENING SESSION, 7.30 P.M.—Art Criticisms on Photography, illustrated with Stereopticon.

THIRD DAY.

MORNING SESSION, 10 A.M.—1st. Reading of Communications.
 2d. Unfinished Business.
 3d. New Business.
 4th. Reports of Committees.
 5th. Election of Officers.

AFTERNOON SESSION, 2 P.M.—1st. Developing.
 2d. Retouching.
 3d. Albumen Printing.
 4th. Bromide Printing.

Discussions following each.

EVENING SESSION, 7.30 P.M.—1st. Platinum Printing.
 2d. Artisto Printing.
 3d. Artificial Lighting.
 4th. Orthochromatic Photography.

FOURTH DAY.

MORNING SESSION, 10 A.M.—1st. Reading Communications.
 2d. Reports of Committees.
 3d. Unfinished Business.
 4th. New Business.
 5th. Announcements of Awards.

AFTERNOON SESSION, 2 P.M.—Order of exercises :
 1st. Music.
 2d. Introductory.
 3d. Dedicatory Address.
 4th. The Unveiling.
 5th. Music.
 6th. Congratulations.
 7th. Adjournment.

Very truly,
 J. M. APPLETON.

CORRECTION.—DAMP COLLODION PROCESS.

PAGE 404, line 43, read : "Resulting from the drying of the film *when* in hot days," etc.

OUR ILLUSTRATION.

THE frontispiece illustration of this issue of the BULLETIN is interesting in giving an example of a type of mankind fast becoming extinct in the march of civilization. The excellent series of negatives placed at our service by Mr. Anderson, of New York, will become more and more valuable as the years roll by. We are glad of this opportunity of presenting our readers with a picture of the frontier types of the American continent, and only regret that we cannot give the entire series in one illustration.

ANTHONY'S PRIZES FOR BROMIDES AND PHOTOGRAPHS FROM NEGATIVES MADE UPON CLIMAX FILMS.

OUR publishers offer the following prizes in competition at the Washington Convention of the Photographers' Association of America, August 12th to the 15th inclusive, 1890, as follows:

1. For the best collection of Plain Enlargements upon Anthony's Bromide Paper, at least six in number, and not smaller than 11 x 14 inches, \$100.
2. For the best Crayon Worked Enlargements on Anthony's Bromide Paper, at least three in number, and not smaller than 11 x 14 inches, \$50.
3. For the best exhibit of Landscape Photographs from negatives made upon Anthony's Climax Films, not less than twelve in number nor smaller than 5 x 7 photographs, the negatives to become the property of E. & H. T. Anthony & Co., \$50.

Competitors must forward their exhibits, prepaid, so that they will reach Washington, D. C., by August 10, 1890.

Prints may be framed or not, at the option of the exhibitor.

Each package must contain a sealed letter stating the name and address of the exhibitor and his private mark outside, a letter being also sent to our publishers with same private mark only; but on no account must any other than the private mark appear on the pictures themselves. Instruction as to the class in which they are entered must also be given, and the pictures numbered on the back to correspond with the number given in the class entry. Judgment will be given to the distinguishing mark, but the awards will be announced with both mark and name.

Be sure and ship your exhibits in good time, as those arriving late will not be apt to get a good place, and will run the risk of not getting there in time to be entered for competition.

All exhibits will be subject to the Association rules. All art exhibits must be sent to George H. Hastings, Art Department Photographers' Association of America, Washington, D. C. All charges prepaid.

AIR BRUSH PRIZES.

THE management of the Air Brush Manufacturing Company, Rockford, Ill., offer two air brushes as premiums at the Photographic Convention, to be held in Washington, D. C., August 12th to 15th—one for the best water colors, and one for the best black and white work to be done by the air brush and exhibited there. Mr. L. Walkup (the patentee of the air brush) expects to be in attendance to meet all who may be interested in the air brush, and who want to know what it can do and what others are doing with it.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.
and a corps of practical assistants.

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Advertisements should reach us not later than the
Saturday preceding the issue for which they are in-
tended, otherwise we cannot promise to publish them
in the succeeding number. It is also necessary to notify
us of any alteration before the date above mentioned,
and to state for what period the advertisement should
be continued—whether for one, six, twelve or twenty-
four issues.

E. & H. T. ANTHONY & CO., Publishers.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—A. S. K. writes:—Will you please through the columns of the next issue of the BULLETIN, give me a formula how to keep a silver printing bath free from albumen? Would you advise nitrate of ammonia and alum in the printing bath during the summer? If so, please tell what proportion of each in a bath of 60 ounces.

A.—The safest way with a bad silver bath is to boil it for five or ten minutes, then filter and either reduce it if too strong or add silver nitrate if too weak. Nitrate of ammonia in the bath will not precipitate albumen, to any important extent, but alum (or kaolin) in small quantity, well shaken up with the bath, will remove a small quantity of albumen. The way to manage it is to make a strong solution of alum and add it slowly, a few drops at a

time, to the bath, shaking thoroughly each time, until the bath shows no color and is quite clear when filtered.

Q.—C. F. writes: Would you kindly answer the following questions: 1st. Enclosed print shows a spotted appearance; negative is also spotted the same way. I am using eikonogen developer, and is this the fault in developing or fixing? Kindly let me know which. 2d. The tone is also bad. As soon as prints were placed in toning bath, they turned even more red than before. Kindly state whether too much soda in toning bath would do this. 3d. Also, which is the best process for enlargements—bromide prints or platinum? Is a license required to make platinum prints?

A.—The spots you complain of are probably due to air bubbles adhering to the plate when you put it into the developer. It is best to wet the plate with water and lightly run over the surface with a soft cloth or brush before putting it into the developer. In regard to prints, too much soda, *i. e.*, carbonate, would not make prints red, but too much salt would. Try washing prints in water containing ammonia (1 dram in 1 quart) before toning, rinsing in clear good water before toning. Bromide prints that are well done can be made as good as platinum prints. Write our publishers for book of instructions. Platinum process by hot development requires a license, but the Pizzighelli direct printing platinum paper can be used without a license. This latter is also supplied by our publishers and works well.

Q.—T. L. B. writes: Will you please send answer through BULLETIN of the simplest way to get silver from an old bath, so as to send it dry to a refiner?

A.—Read the article on "Photographic Wastes and How to Save Them," in the BULLETIN, January 11, 1890, page 24. You will there find a variety of processes suited to different cases.

Q.—G. F. writes: On page 333, Vol. XXI of BULLETIN, is given "Pellet's Process" for copying tracings. The writer makes no mention of how to prepare paper previously to printing. Can you give the necessary information through the columns of your paper, or any other good and simple method that an architect could use for taking copies of tracings which would have either a blue or black line on white ground?

A.—Use the formula given on the same page and above the paragraph you mention. It works nicely if you keep the solution clear and filter it often.

Q.—W. F. C. writes:—will you favor me by helping me out of a difficulty? I have two 8 x 10 negatives that, for peculiar reasons, I am specially anxious to save. They are Cramer, 60 sensitometer, properly exposed. I developed them with eikonogen, and, though all detail came up beautifully, I failed to get sufficient density. Excepting the lack of density the negatives were perfect. To intensify them I placed them in a nearly saturated solution of bichloride of mercury, and, after they whitened, in a very dilute bath of ammonia. I would explain that the plates were thoroughly fixed and thoroughly washed and dried before intensification: also thoroughly washed between the mercury and the ammonia baths and after the ammonia. As soon as washed after the ammonia bath, I noticed that they were stained slightly brown, but uniformly over the whole plate. Since drying and endeavoring to print in the sun this brown stain has deepened to such a dense reddish brown as to prevent printing, as the sensitized albumen paper bakes and spoils in the sun before the print is completed. Question—How can I remove this brown stain without losing or injuring the negative? Don't care if the intensification disappears in removing the stain, as I would reintensify with a proper solution, taking every precaution to avoid renewing the stain. The hypo was clean, and the negative lay in the hypo from ten to fifteen minutes after all white had disappeared in viewing it from the back, nor was it submitted to even artificial light before fully fixed. A clean alum bath was used after fixing. I have never met this difficulty before. Hence my seeking your advice. I have a third plate similarly stained which I

can experiment on, as I do not care for it, having a good duplicate that I did not intensify.

A.—See the paper of Professor Alexander Lainer, page 116, in *BULLETIN* of February 22, 1890. We think an application of a reducing bath made with acid sulphite will answer your purpose.

Views Caught with the Drop Shutter.

FRANK E. GILLIES, charged with arson in setting fire to his photograph rooms in March last, was found guilty at Boston by a jury, July 28th. The motive, it is alleged, was to obtain the insurance placed in the First National Insurance Company in Worcester. Exceptions were taken and the case goes to the Supreme Court.

THE BLACKMORE CAMERA CO., of Grand Rapids, were burned out July 13th. The loss is estimated at \$8,000.

THE enterprise of some of our Western dealers may well be emulated by their more eastern brothers, if the catalogue just issued by MULLETT BROS., of Kansas City, Mo., is any indication of their "push" in other directions. It is numbered 11 in their series, and is a well printed and compiled volume, 8¾ x 11½ in size, and contains 183 pages of illustrated descriptive matter. We congratulate the craft in the west that they have such a well equipped house from which to obtain their supplies.

MESSRS. BARTHOLOMEW & PECKHAM, the photo-engravers of Spruce Street, New York, send us a handsome album of their work. It is certainly an excellent testimonial to their ability, and is among the best of this class of photographic work—clean, artistic, and presented in good taste.

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Mr. H. Townsend Colburn

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

AUGUST 23, 1890.

Vol. XXI.—No. 16.

THE DAGUERRE CONVENTION.

THE eleventh annual convention of the Photographers' Association of America is now a thing of the past, and every one connected with it may be congratulated on the grand success of the whole affair.

The event that took the Association to the City of Washington was undoubtedly the unveiling of the monument to Daguerre, and we are glad to say that this beautiful tribute to the memory of the father of photography is now safely placed in charge of the United States Government, an accomplished fact.

There is no doubt that many members of the Association were afraid to venture to Washington on account of the great heat of the city at this time of year. But those who took the chances were delightfully surprised and enjoyed some of the most agreeable weather ever experienced at any convention. Instead of the torrid heat usually found in the capital city at this time of year, the temperature was quite moderate, and except in the middle of the day was unusually pleasant. Washington, with its beautiful parks and avenues of trees, had on a wonderfully refreshing dress of verdure seldom seen at this time of year; and all who were present at the convention will remember its delights for many years to come.

The success of the meeting was due to these happy circumstances and the judicious management of the executive officers. Through the kindness of the United States officials the sessions were held in the National Museum, which was kindly given up to the Association free of charge. We owe this to our good friend, Professor Smillie, the photographer of the department, and also to those associated with him. The Association cannot too heartily thank this gentleman for his untiring efforts for their comfort and the success of the whole convention. The place of meeting was singularly appropriate in spite of the crowded condition of the manufacturers' and art departments.

There is no doubt that many more photographers would have been present if it could have been foretold that we should have such delightful weather. And in spite of all the doubts in this direction nearly four hundred members were in attendance. Another element of success was the very able management of the executive officers in providing such an excellent programme and in carrying it out. There has never been a convention of the Association where everything worked so smoothly and so much valuable instruction has been given to the members as has been accomplished at Washington. There was an

unusually large number of papers presented, and the discussions were entered into by the members in the most hearty and satisfactory manner.

The most important event was the unveiling of the Daguerre monument, and all members were very anxious to know how the committee who had it in charge had accomplished its task. It is only twelve months ago that the Association decided to erect this monument, and much cold water was thrown upon the project owing to some severe criticism of the early design made public by the committee. As a consequence, subscriptions came in very slowly, and on arriving at Washington the committee could only report the receipt of twelve hundred dollars. Since the monument was to cost six thousand dollars, there was much anxiety as to the action of the convention. But thanks to the rallying speeches of Mr. Frank Pickerell and others, the good name of the Association was not allowed to be dragged in the mire. The Association was reminded that the honor of raising the monument was theirs, that their officers had obeyed orders, and had accomplished their task to the best of their judgment. It was undoubtedly the duty of every member to sustain the officers. And we are glad to have to record the fact that it has been done nobly. Never, in the history of the Association, has there been such a hearty support of the officers in their efforts to carry out the wishes of the members. When Mr. McMichael had made his report in a calm and business-like manner, stating simply what had been done, and appealed to the Association for judgment, there was a ripple of dissent for a moment, but the veteran voice of Mr. Pickerell called the members to their duty, and every one felt it was a time for action. Mr. Cramer, of St. Louis, pledged five hundred dollars, and then Mr. McMichael announced that Messrs. E. & H. T. Anthony & Co. would do likewise. This was a good start, and in less than one hour after the report the members had swelled the amount to two thousand dollars. After this subscriptions came in continuously, making it evident that the monument would be paid for by the photographers of America, and that speedily. There is still room for subscriptions, and every photographer in the country should be proud to have his name upon the list of those who honor the father of our art.

To those who did not like the designs that have been published we would say that these were totally inadequate to express the beauty of the finished work. Those who saw the statue unveiled were very happily surprised, and joined in the general admiration of the finished work. We will not attempt to describe the beauty of this unique work of art, but would advise all to see the pictures of the completed monument that will soon be made. We can only say it is beautiful, unique, a credit to Scott Hartley, who designed it, and worthy of the admiration of every photographer in America. To those who have not yet subscribed we would say: send your subscriptions to Mr. McMichael, Main street, Buffalo, or to us, and the day will come when you will be proud of having an interest in this tribute to Daguerre, even if it be but one dollar.

Our amateur friends must not forget that they also may share in the honor of raising this monument. Let the various amateur clubs send subscriptions to this noble work for the sake of the art that to them is "a joy for ever."

We have already exhausted our space for the convention. We would only add that our readers will find the reports in the *BULLETIN* full and accurate, and we can assure them a great treat in the perusal of these and the papers read at the meetings.

There is no doubt that these conventions are raising the standard of photography in the United States. Each year the work becomes more beautiful through the influence of the members of the Photographers' Association scattered through this country. If more of the fraternity would only come into the ranks and learn what can be done by united effort, they would soon find a better way to gain a larger remuneration for their work, better homes and greater happiness for those that are near and dear to them. There has never before been such an exhibition of the strength of this Association as was seen at the Washington Convention, and all who wish to enjoy this strength and increase it should enter the ranks and grow with it.

EDITORIAL NOTES.

Dr. R. S. LIESEGANGE recently published a new and interesting method of intensifying negatives by which no damage is done to the negative, as is often the case. His process is, first, to varnish the negative in the usual way, after which he again coats it with collodion or varnish, in which has been previously dissolved red or green coloring matter of an aniline nature, which is sensitive to light. On exposure to direct light, through the negative, the clear parts are bleached out, while the half tones and blacks change only in proportion to the density of the different parts. The principal objection to be urged to this method arises from the fact that the aniline colors will gradually fade as prints are made from the negatives so treated, and the process then has to be repeated; but Dr. Liesegange suggests that some of the iron salts, such as are employed in the making of the ferro-prussiate paper, may overcome this difficulty. If such salts were used, however, the negative would have to be re-developed.

MUCH has recently been said upon the advantages to be derived from a combined developer of hydroquinone and eikonogen, it being claimed for this combination developer that it has the same energetic action as eikonogen, with less liability of fogging the shadows, and gives at the same time a density similar to that of hydroquinone. A formula recently given to the Parisian Photographic Club as having produced satisfactory results was as follows:

Sulphite soda.....	100 grm.
Eikonogen.....	15 grm.
Hydroquinone.....	5 grm.
Dissolve in hot water...	1 liter.
Carbonate potash, to be added after cooling.....	50 grm.

In the discussion attendant upon the production of this formula it was stated that a great deal depended on the temperature of the developer as to the length of exposure necessary for a full-timed negative, and experiments were made which showed that while with the developer at a temperature of 20 degrees C. a perfect negative was produced with an exposure of six seconds, the same result was obtained with four seconds, using the developer at 30 degrees C.; and further, that if the developer were lowered to 10 degrees C., it required an exposure of from twelve to twenty-four seconds to give a corresponding density. We await the results of experiments in this country with interest.

WE note from our exchanges an account of a most courageous and interesting experiment in the way of photographing the explosion of a 250-pound

charge of dynamite from a dangerously close point of view. The scene of the explosion was in Savin Hill, near Boston, and the negative made by Dr. George H. Bailey, of that city, who succeeded in obtaining a most interesting negative of the *débris* just as it reached the highest point in its ascent. He succeeded in getting himself and camera out of the way only just in time to escape serious damage from falling rock. We would commend the courage of the operator, without advising others to emulate his example.

How many of our photographic friends who have been to the convention in the body or via the published accounts thereof are acquainted with the fact that the Smithsonian Institute owes its existence to the generous endowment of the son of an English peer? Such, however, is the case, as the institution was founded by a bequest of \$515,169 "for the increase and diffusion of knowledge among men" by the Hon. James Smithson, who was the younger son of the Duke of Northumberland and brother of Earl Percy, who led the British reinforcements at Lexington, and who also commanded a division in the attack on Fort Washington in this city during the Revolution. James Smithson was of an extremely studious temperament, having graduated from Oxford with an honorary degree the same year that his brother, Hugh, Earl Percy, became Duke of Northumberland. His strong ambition was to leave behind him a name which should endure, and from present appearances his ambition and desire is in a fair way of accomplishment.

As eikonogen developer for bromide prints and enlargements given by Dr. Just and credited to Dr. Krugener has been found to give excellent results, and is compounded as follows: Dissolve in

Sodic sulphite.....	320 grains.	600 c.c.
Sodic carbonate (crystals).....	240 "	20 gm.
And add eikonogen.....	80 "	15 "
Water (distilled).....	20 ounces.	5 "

With potassic bromide as required, from 1 to 10 drops per 1,000 c.c. of developer. Old eikonogen is preferred to new for bromide work, only that if too old the paper is apt to stain around the edges, particularly if the paper too is not fresh; so it is recommended to use part freshly made developer with some old added, for each print as developed, rather than to use the same batch over and over again for several prints.

WE have received from C. E. Vredenburg, of Elizabethtown, N. J., a print made from negative on Anthony's Climax Negative Film which speaks eloquently in two directions, not only in commendation of the one who produced the picture, which is a charming bit of child-life study, but as well for the film which so well transmitted the view before the camera. The more specimens of work we see done on films the more are we convinced of the possibilities that in them lie.

MONS. A. M. VILLOX gives a simple and effective method of transferring photo-lithographs and collotypes to glass, as follows: Make a print from the desired plate on glazed paper with color made of stearic acid, 3 parts, asphalt, 2 parts, and oil of turpentine, 3 parts; after which hold the print over a saucer

of hydrochloric acid, 1 part, and water, 4 to 6 parts, until condensation of the fumes occurs. Float on lukewarm water till the colors soften, then lay upon the glass, with the image downward, and roll with a rubber roller; moisten the back of the paper and strip. The glass may then be etched in the usual way with hydrofluoric acid.

WE learn from our exchanges that a machine has lately been patented in England for the mounting of prints in quantity and at a great saving of time and labor, the principle of which may be described as a box, hinged at the back, and with the top and bottom divided into compartments to hold the mounts and prints, respectively. A spring arrangement in the bottom of each compartment presses the picture up to the top, where it receives its coating of starch paste, and by closing the top and releasing a tension by foot-power, is forced into contact with its respective mount. After mounting in this way the prints are dropped into a receptacle lined with blotting paper and the operation is repeated indefinitely.

At a recent meeting of the London and provincial societies some interesting negatives were shown which had been made on Obernetter's films. Mr. J. R. Gotz, who made the exhibit, explained that the basis of these films was hardened gelatine, which was proven to be a very good vehicle for carrying the sensitized emulsion, as it was free from halation, and was only slightly more expensive than glass. The film becomes perfectly flat when placed in the developing bath, and the treatment of the film is similar to that of glass. These films are now made only in cut sheets, but experiments are in progress with a view to manufacturing them in roll. The sensitometer of those shown was about 23 Warnerke.

WE note from our exchanges a most entertaining account of experiments made by Mrs. Watts Hughes in connection with the photographing of sound-waves. By the construction of a hollow receiver, over the end of which is tightly stretched an elastic membrane, the surface of which is covered with a semi-fluid paste, a basis is secured for the transcription of the sound-waves, which may subsequently be photographed with ease. The voice of the singer projected into the receiver registers itself on the membrane and is transferred to the paste, and the wonderful forms there depicted are most beautiful. Flower, tree and fern forms are most common, and are often mixed with those of star-fish, sea anemones and shells of the most intricately voluted patterns. Variations in the quality or quantity of sound thrown into the receiver produce wonderful changes in the forms shown on the plastic surface, and the entire subject is one of great interest and of no small scientific value.

At a recent meeting of the German Society of Amateur Photographers of Berlin Mr. J. Gaedicke exhibited, as the result of many years' patient study and experiment, a number of highly sensitive collodion dry plates, which he claims combine the sensitiveness and keeping qualities of the gelatine dry plate with the advantages of the wet collodion plate. The film of these plates is extremely thin and is very rich in silver, and when dry is quite susceptible of damage by careless handling, but when wet and after development is hard and tough. Before development the plate is soaked for about a minute in cold water. An

old hydroquinone developer, with about one-tenth of its volume of new, is considered the best. After development and fixing the amount of washing required is said to be much less than for the gelatine dry plate, which, it is claimed, is one of its prime advantages. Among its other claims to superiority may be cited that, in consequence of the thin film, the image is sharper, that the deposit is of a finer grain, and that the time of exposure offers a greater latitude. We shall be glad to hear more of these new plates.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Collodion versus Gelatine.—Gaedicke's New Invention.—Gaedicke's Experiments with Developers.—Photographic Tests of Red Glass for the Dark Room.—Effects of Paper Wrappers on the Keeping Qualities of Dry Plates.

SINCE the introduction of the gelatine process pains have been taken by many to improve the old collodion process to such an extent that it unites the facility and rapidity of development, fixing and washing with the sensitiveness of the gelatine plate. The first attempt of this kind was probably my gelatine-collodion. I dissolved dry gelatine emulsion in glacial acetic acid and mixed the same with methyl collodion. In this way an emulsion was formed which flowed in a warm state upon the plate; like collodion, was dry within an hour, and developed, fixed and washed as quick as collodion plates. The film resisted even boiling water. The process has been applied more or less since 1883, but it lacked durability, because the gelatine decomposed from the collodion with formation of acetic ether. Several scientists experimented later on in a different way, but so far without success. It seems now that Gaedicke, the inventor of the flash-light, has at last succeeded. He makes the following communication:

About the durability of the plates I have an experience of six months, during which time they have not decomposed, and there is no reason to doubt their durability any longer.

The observation had been made that the old, the not very sensitive collodion dry plates produced with preservatives, had to be developed quickly after exposure, as otherwise the picture would disappear again.

To test now my new plates with regard to this property, five small sensitometer plates were cut from a plate and exposed uniformly to gaslight. One of them was developed at once; the others were kept in the dark and developed at different periods.

The first plate gave the number 16; the second was developed after two days, the third after eleven days and the fourth after six weeks, and all gave uniformly the number 16. The fifth plate is still kept in the dark and will be developed at some later time. As a preliminary it is therefore confirmed that the impression of the image will remain unchanged for six weeks.


The sensitiveness of my collodion dry plates resembles that of a gelatine plate of medium rapidity, but remains behind the highly sensitive gelatine plates. Of course they are only produced color-sensitive. The film is very thin and rich in silver and in a dry condition easily injured, requiring great care in handling the same. After fixing in a wet condition the film is so tough that it can be rubbed with the fingers.

Regarding the treatment, a considerable over-exposure will not do the least

harm, having in the development the means to retard the same. After exposure the plate is flowed with water and left to soak for fully a minute, because too rapid a development would produce fog. After the water has been poured off the soaked plate is flowed with the developer. The most suitable is an old hydroquinone developer, to which has been added a small quantity (about $\frac{1}{10}$) of fresh developer. The picture appears in six to twenty seconds, according to time of exposure, and the development is completed in one to two minutes. The plate is now rinsed well and placed under the faucet for about five minutes, or in a dish with water, which is renewed several times. After this it is free from soda and has lost also its pink color. In a short time it can now be dried in the open air or with artificial heat.

So far Herr Gaedicke. But probably you know more now in America about the subject than we do, it being Herr Gaedicke's intention to place his invention first into market in foreign countries.

Talking now about Mr. Gaedicke, I will also mention his experiments with different developers on under, over, and correctly exposed plates. He has compiled his results in the following table :

( See original article of Gaedicke on page 491.)

The exposure was in gaslight, behind a sensitometer scale. Gaedicke says :

At quite a normal exposure good negatives can be obtained with all developers. But the hydroquinone developer is considered as the most convenient, most durable and cheapest. It can be bought concentrated ready for use at a very low price ; no measurements are required ; no part is missing at a critical moment, and the dilution of a new bottle of the developer takes not more than two minutes. As generally two-thirds of old and only one-third of new developer are used, the hydroquinone developer is therefore the cheapest.

For greatly over-exposed plates, as is oftentimes the case in landscape photography, pyro and hydroquinone are applicable, but hydroquinone is to be preferred.

It is also oftentimes the case that negatives are to be developed of which the time of exposure is unknown, and the safest developer for this is hydroquinone, two trays being used with equal quantities of developer, the one being old, the other new developer. The plate is first flowed with the old developer and then with the new. If no picture appears after the first minute, new developer should be carefully added and a good result will be certain.

But the hydroquinone developer has one dark side : it develops only with difficulty in cold weather, and the developing room should therefore have always a moderate temperature.

In my last letter I wrote to you about red glass for the dark room lamp. The result of this publication was that quite a number of red glasses were sent to me for examination ; but almost all of them were useless. Complaints have also been made that I proposed a spectroscopic test instead of a photographic one, which could be made by everybody.

But the thing is, after all, not so simple as we imagine, because the photographic test deceives much easier than the spectroscopic test, and there is considerably more danger to reject actually good glasses, as the following test will show :

A red dark room light, pronounced good spectroscopically, was applied in front of a gas flame. The gaslight used varied, on Bunson's photometer,

between seven and eight candles. To test the good quality of the light, the most different kinds of plates, among them a number of scientific spectral views, were developed without fault, during four weeks, in the ordinary way, the tray being kept in the shade during development, and only from time to time they were examined for a few seconds in the light of the red lamp. After the plate had come to an advanced state of development it was examined at about 20 c.m. distance from the gaslight for some seconds. The yellow side light of the lamp, which admitted the passage of remarkably blue light, remained open without the rays of the same touching the plate directly.

The usefulness of the red light having been determined in this manner, even for eoside of silver and azalin plates (with the latter I kept the developing tray covered), the photographic test took place.

1. A Sachs plate was exposed for sixty seconds under a reproduction negative with very transparent clear parts at a distance of 18 c.m. from the gaslight (by inserting the red light), and was then developed with fresh hydroquinone developer without bromide of potassium. Result: Weak but very distinct copy of the transparent parts of the negative after long development.

After this result many would undoubtedly have discarded the red glass as useless.

2. The same experiment was repeated at 36 c.m. distance in the same manner. At this double distance the light was therefore four times weaker.

The plate was then developed for a long time (until the beginning of fog). Result: Very weak picture of the lightest parts of the negative.

3. The same experiment (2) was repeated, in thirty seconds' time of exposure.

After long development the faint outlines of a picture were now only visible.

Already, nine years ago, Abney made the observation that light having passed through the red glass is by no means without effect upon ordinary plates, and he recommended at that time an addition of iodide of silver to the bromide of silver emulsion, to make it less sensitive to red light.

If, therefore, such a dark room lantern is to be tested it should be determined if it admits the reading of common-size type at one foot distance; further, whether it will make only a faint light impression or none at all at a foot distance in thirty seconds. I remark here particularly that I never advise daylight, but only gaslight, for the dark room.

I have written to you repeatedly about the great damage caused by bad paper wrappers used for packing dry plates, but my advice seems to have been without success so far. Recently I opened a package of dry plates of a well-known Berlin firm, three months old, and found that the plates had a black border of a third of an inch.

That fog on the edges will form even without wrappers has been shown by Wilde; that it will occur easier with ammonia emulsion has been observed by Armstrong; that the atmosphere, or, better expressed, evaporations, play a rôle has convincingly been demonstrated by E. Vogel, by showing that impure wrapping paper acts even through pure paper in which the plates were packed. Lately it has been particularly proven that plates will fog very quickly on the edges in an ordinary pasteboard box, but that it will be much slower in a box soaked with paraffine.

Gebhardt observed that highly sensitive plates are more rapidly subject to fog

on the edges (after four months 3 to 5 m.m. wide) than less sensitive plates. Plates made in winter are more durable than those made during the summer. Different kinds of wrapping paper showed no difference.

Gebhardt examined also the layers between the plates. Black soft and gray wrapping paper gave a strong fog after three weeks; while filter paper, tinfoil and yellow tissue paper had very little effect. Gebhardt's idea, that only the atmosphere and not the wrapping papers is the cause of decomposition, is therefore erroneous. Many wrapping papers act upon the atmosphere by evaporation.

KARLSBAD, July, 1890.

ALL SKYLIGHT AND NO ROOF.

BY "NOMAD."

How many of the profession know anything about portrait work in a tent? How many are able to sympathize with a sharp anxiety which watches the sky for fair weather on Friday evening hoping for a fair Saturday, or are troubled by a gloomy morning on a legal holiday? How many men in New York, nicely housed in a gallery, ever think that the word "rain" in Saturday's weather report forecasts the loss of half the week's possible income to some of their less fortunate brothers in the city who are protected by a canvas roof only? How often do the great masters of the art ever consider that a hard rain, extending over Saturday and Sunday, absolutely stops all income and all work in fifty outdoor photographic places within twenty miles of City Hall? Not many, we fancy, have ever considered such things.

But there are many men in this great city who can and do make good portraits under the open sky, save when lavish nature makes it necessary to draw the fly of the tent. True, the pictures are usually of the despised tin-type variety, but there is a chance to display the artist even in the tin-type.

Along some of the great uptown avenues there are dozens of tents or shanties where tin-types are taken, "Finished while you wait." The bare ground is often the only floor, and sometimes the accessories are furnished by nature herself. We know of one picturesque little tent where a clump of wild flowers, roots, grass and all have been taken into the tent, and where the trunk of a tree that shades the tent with its foliage is one of the helps toward making natural surroundings. No grass mat is wanted for the feet, because grass growing on the floor of the studio is all that is needed. The interior of one of these tents would often make a very pretty picture. The rustic work is usually made from bits captured within a few moments' walk of the tent. The tent itself, with side and top open, and filled with the odds and ends of photographic apparatus, is cozy and inviting. It sometimes deserves the name of "studio" quite as much as the more elaborate workshops of the town. When "paper" work comes in the results are much better than would be expected. The drawback is the want of good subjects. One does not go into the fields in a ball-dress to have a photograph taken, nor do the society beauties usually patronize the tent, but good things are often accomplished under the canvas—not as mere matters of luck—by no means. These men have advantages over their better-housed brethren. They can take children under almost any circumstances. Even on cloudy days their illumination is surprisingly brilliant. There is no glass between the subject and the sky. It is only a question of modification and toning down the

too abundant light. The fastest drop shutter will give an ample exposure, even with a stop that insures great sharpness. In fair weather they have only to draw thin roof curtains and they can get any effect they desire. Top or side light, single rays giving strong high lights, are accomplished by the most simple means, if desired. But, as a rule, "effects" are not wanted. The plain, straightforward, business-like portrait fills the bill to perfection, and satisfies the sitter that a fair return has been given for the quarter.

The kind of men found under canvas are quite as surprising as the possibilities of the canvas itself. There you will meet a little German who probably learned all he knows at some small place in the Bowery. Here is another, of whom you can make nothing. He looks like a prize-fighter; has the air of a man who follows the races and talks business every time. Under another tent you may come across a pleasant, thrifty Hebrew and his wife. Both understand the business, and both welcome a brother photographer in a kindly way, though evidently sorry that he cannot be turned into a customer. But they will talk pleasantly of the rain, which has perhaps rendered it necessary to take precautions with the apparatus and make a tripod do duty for an inner tent to protect from drippings by the aid of the focusing cloth.

One day I came across a friend of Scott Archer, under canvas, making tin-types. He began in 1851 and has kept at it till to-day. Half the old English photographic worthies were counted among his acquaintances. Here the reader expects a little romance. An old man, driven to the open air by misfortune to gather a scanty pittance from the holiday-makers, the last resort of the old photographer. Nothing of the sort. The man, still in the prime of life, looking about forty, takes to his tent to make money, because he knows the business. In the box in the dark closet—it's too small to be a "dark room"—he has Ross, Grubb, and Dallmeyer portrait lenses. And, think of it! he will have next week a multiplying camera fitted up with four Dallmeyer portrait lenses on its front board. That is pretty good for a canvas gallery which, outside of cameras and lenses, could be set up new for less than \$30. But you see the man knows that his good lenses pay and he is not afraid to invest at the paying end of his business. There's a small moral here thrown in, after the manner of the great showman, without extra charge.

But the queerest, strangest photographer of all is not met by the ordinary excursionist who passes up and down through the parks and boulevards. You see a tall man in hard-worn and weather-faded clothes, stained but not seedy, walking along rapidly. He carries an ancient 4 by 5 camera in his hand. An old Anthony box with a rigid bed made long before a gelatine plate was dreamed of. It is worn, literally. You fancy that the bed was made of sticks that were turned in the lathe. Every corner and angle were obliterated years ago by wear and hard usage. Still, everything is in strictly workable condition. Nothing is broken or out of order. The focusing cloth is packed inside the ground glass. The tripod is of more modern make. If you speak you will notice that the coat and vest are a little puffy in front. In fact, he seems a trifle stout. This man, with his little tripod and camera in one hand, the other empty, is a professional wet plate landscape photographer out in search of an order. No "press-the-button" fiend ever traveled lighter-handed. Where he finds a subject and an order he is ready for operation. In his pockets he has glass on which to make his negative, collodion, a silver bath, developing and fixing solutions. He will

make a dark room out of the first dimly lighted corner he may find, and will not leave his subject till he has a good negative that he knows all about. You meet him, have a pleasant chat, compare notes on light and exposures, tell of your methods, looking into his sun-burned face and having no feeling of anything unusual. After he is gone, the wonder of the man grows upon you. The resources, the command of the process, the infinite fertility that enables him to carry a wet plate outfit in his vest pocket, overwhelm you. The imagination shows what manner of man has passed. You wish you could bring him back and make him talk of himself. You are sure he was a Yankee. The clean-cut sentences, the clear blue eye, a certain elastic wiry air about the whole person, were some of the things that made the idea almost a certainty. And in spite of the worn and weather-beaten appearance of the man, there was a touch of thrift which was pleasant to think of. If he wandered, it was not the wandering of the tramp in search of new fields in which to beg. Now you wish you had asked about the lens he used and the prices he asked. In a word, your curiosity burns you up. But he is gone. You hope, as we did, that some good fortune may send another meeting. In the meantime we think that we talked for ten minutes with the most remarkable photographer that we have ever met, and that he has gone and we do not know his name or address, nor even what city he comes from. Our sympathies are with him. We wish him all success, monetary and artistic, which his push and ingenuity deserve. We envy him his methods and his independence. "May he live long and prosper" and we to see him!

[*Photographische Mittheilungen.*]

COMPARISON OF DEVELOPERS MOST GENERALLY USED.

BY J. GAEDICKE.

COMPARATIVE tests about development or emulsions can be made only with the sensitometer and a constant light-source, negatives made in the gallery in the ordinary way being subject to so many casualties that a sure result cannot be expected; besides, the tone-proportions cannot be properly expressed in numbers where portraits of this kind are taken.

The sensitometer was therefore employed to get at the dark and bright side of the four most general developers, oxalate of iron, pyro, hydroquinone and eikonogen. The tests were divided into three different sections. The first was under-exposed with one-fifth of the normal exposure. It represents the case of instantaneous views. The second section was fully exposed, and the third was four times over-exposed.

Each section was treated as being under the most favorable conditions. To the iron developer I added two drops of the accelerator of fixing soda and bromide of potassium; to the hydroquinone were added four drops of a 40-per-cent. potassium lye, and the eikonogen received some potash after application of the bath of fixing soda and chloride of mercury recommended for instantaneous views.

The development proceeded until a slight fog was to be apprehended.

Each test was repeated two to four times, to exclude accidental defects by harmonious results. The plate applied was a chromo plate of my own manufacture. All plates, of course, were of the same emulsion. The fields of the sensitometer consisted of one to sixteen layers of tissue paper.

The light-source was a gas-flame (fish-tail burner), which was turned down so as not to flicker.

The results of these tests you will find compiled in the following table. The conclusions will follow.

A. Under-exposed Plates.—Exposure, (1) second. Gaslight at 72 c.m. distance from the flame—that is, one-fifth of the normal exposure.

No.	KIND OF DEVELOPMENT.	The picture appears in.	Time of development.	Last readable number.	Character of the picture, with remarks.
1	Oxalate of iron, with addition..	9 sec.	5 min.	14	Yellow fog 1 and 2 show very little difference.
2	Pyro-potash	12 "	3 "	14	Red fog.
3	Hydroquinone, with potash...	20 "	3 "	15	Clear.
4	Eikonogen—potash, with preliminary bath.	6 "	3 "	14	Yellow fog.

W. L. man
you

B. Fully Exposed Plates.—Exposure, (1) second. Gaslight at 32 c.m. distance from the flame.

No.	KIND OF DEVELOPMENT.	The picture appears in.	Time of development.	Last readable number.	Character of the picture, with remarks.
5	Oxalate of iron, pure	12 sec.	3 min.	16	The negatives were all good and harmonious. By transmitted light the pyro negative was brown-black, the others blue-black, therefore better adapted for printing. The least clear was the picture made with iron developer.
6	Pyro-potash	8 "	2 $\frac{3}{4}$ "	16	
7	Hydroquinone	25 "	3 $\frac{1}{2}$ "	16	
8	Eikonogen—soda	12 "	3 "	16	

C. Over-exposed Plates.—Exposure, (4) seconds. Gaslight at 32 c.m. distance from the flame—that is, four times the normal exposure.

No.	KIND OF DEVELOPMENT.	The picture appears in.	Time of development.	Last readable number.	Character of the picture, with remarks.
9	Oxalate of iron, with 4 drops bromide of potassium (1:10).	18 sec.	3 $\frac{1}{2}$ min.	16	1 to 8 little gradation, weak and not fit for use.
10	Pyro potash, with 8 drops of bromide of potassium	20 "	2 $\frac{1}{2}$ "	16	Better gradations than No. 9. Somewhat too hard, but still fit for use.
11	Hydroquinone, only old developer, with 8 drops of bromide of potassium	60 "	5 "	16	Normal negative the best of this group.
12	Eikonogen—soda, with 8 drops of bromide of potassium	30 "	3 $\frac{1}{2}$ "	16	Weak and unfit for use.

For development there was always taken 40 c.c. of solution. All developers were newly made and were applied after standing twenty-four hours, which was deemed necessary, because pyro, immediately after solution, will act considerably

more energetic than after twenty-four hours. As it might not take place in practical life that immediately before each development the necessary quantity of pyro is freshly dissolved, the solution was applied as above.

To the oxalate of iron developer were added 2 drops of a solution of 1 gram of fixing soda and 6 grams of bromide of potassium in 60 grams of water for the under-exposed plates, and for the over exposed-plates 4 drops of bromide of potassium (1:10). Those of normal exposure received no addition.

The hydroquinone developer for under-exposed plates was composed of 20 c.c. old, 20 c.c. fresh developer and 4 drops of a 40-per-cent. potassium lye.

For the normal exposed plates were applied two-thirds old, one-third fresh developer and 4 drops potassium lye. The over-exposed plates were developed only with 40 c.c. of old hydroquinone developer, with 8 drops of bromide of potassium solution (1:10).

For eikonogen the regular formula was used, for under-exposed plates the application with potash; for instantaneous views with preliminary bath. For normal exposure the formula with soda in two solutions without any additions, and for over-exposure 40 c.c. eikonogen soda developer, with 8 drops of bromide of potassium.

The most favorable conditions, according to the preceding, were given to each developer to accomplish the best. Let us see now how the results of the table figure out these accomplishments. Above all, the fact is evident that with normal exposure and suitable treatment good negatives can be obtained with all developers. But the assertion might not be too bold that absolutely normal exposures are hardly adequate with the majority of views taken, and that therefore a great many views are either over or under exposed, and that this has to be remedied in the development. We have to examine, therefore, the developers in their actions upon under and over exposed plates to discover which is the most suitable to meet these occurrences.

Taking the under-exposed plates into consideration, we have in the height of the sensitometer numbers a measure as to which developer will accomplish the most.

When oxalate of iron with addition of eikonogen and pyro shows the number 14, it follows with certainty that eikonogen will not accomplish more than iron or pyro. But as with hydroquinone we can still recognize the number 15, it accomplishes more than all the others; and further, as all the others are suffering from yellow and red fog on account of the forced development, while number 3 is the only clear picture, the conclusion is that hydroquinone is the most suitable developer for instantaneous views, if equal parts of old and fresh developer are applied, and to each 10 c.c. one drop of a 40-per-cent. potassium lye is added.

With quite normal exposure, good negatives can be obtained from all developers, as remarked before, and we have to look, therefore, for other reasons as to which we shall give the preference. We have, therefore, to look for the most convenient, durable and cheapest, and then we have again the hydroquinone developer as the most advantageous. It is a solution that will keep, and which can be bought in market at a very cheap rate in concentrated form, ready for use. It can easily be diluted in two minutes. The hydroquinone developer is also the cheapest, as generally two-thirds old and only one-third fresh solution are used.

The eikonogen, as far as our experience goes, is even in separate solutions not so durable as the hydroquinone. After a few days it will show already a tendency to fog, and if old developer is used, all the other advantages of the eikonogen will disappear.

Pyro is inconvenient on account of its inferior durability and the necessity of frequent renewal of a fresh solution, and because it can only be kept safely and practically in separated solutions. For greatly over-exposed plates, according to the table, pyro and hydroquinone are most suitable. But hydroquinone is to be preferred.

It is oftentimes the case that negatives are to be developed when time of

exposure is unknown. Here we work safest with hydroquinone, by having two trays with equal quantities of developer, one old, the other fresh. The plate is first flowed with the old developer and then we watch the time. If no picture appears after the first minute, fresh developer is gradually added according to requirement, and we can be certain of obtaining good results.

The only disagreeable part of the hydroquinone developer is, that it develops only with difficulty in cold weather, and it is therefore necessary to select a proper place with a medium temperature.

The final result of the foregoing experiments is, that to the present day the hydroquinone developer—being the most complete in all directions—is to be preferred to all others.

PROFESSOR MASON'S ADDRESS OF WELCOME AT WASHINGTON.

Mr. President and Members of the Photographers' Convention: I regret exceedingly the absence of the gentleman who had prepared for this occasion a fitting address of welcome. Your reception shall not for that misfortune be any the less hearty.

I believe that sacred story and the latest science teach that the first phenomenon in the universe was a flash-light, which in one instant filled all space. There were no photographers there, and it is just as well that there were not, because that infinite camera was void.

The first allusion that I can find to your honorable craft is in the history of Phrygia. It seems that the goddess Minerva was as fond of the flute as was Apollo of the lyre. One day after playing most sweetly upon her favorite instrument she laid it down upon a rock. The spirit of her delicious music lingered within the reedy walls as it does until this day. A peasant named Marsyas, coming that way, picked up the flute, and blowing his breath therein, heard the loveliest melodies. He immediately challenged Apollo to play with him, and well-nigh beat the fiery sun-god, who became so enraged that he took the life-sized photograph of Marsyas and hung it on a tree. Here, says the historian, it may be seen until our day.

At the unveiling of the statue of your great patron saint of the nineteenth century, on Thursday, this history will be continued to the present time. It remains for me to welcome you to the national capital. The skies are indeed propitious. General Greely has, by a legerdemain peculiar to himself, delightfully shut off the red rays of the sun, for which I believe you have little use, and allowed that versatile luminary to shower violet rays upon you from a cloudless sky.

I welcome you to our long streets and avenues, shaded with trees whose leaves have scarcely begun to fade out; to our parks, laughing in the thousand tinted flowers, envy of all photographers; to our hundred miles of asphaltum streets; but it would demand the genius of Nicephore de Niepce to detect in them the slightest odor of lavender.

I welcome you to the halls of Congress, each in its camera obscura trying to detect upon the darkened walls images of society and the outside world to shape our laws thereby.

I welcome you to the departments of our government, where you will find many of your skillful brethren practising their art to aid the astronomer, the engraver, the geographer, the biologist and the detective. All of these look with especial interest upon your work, by reason of its promise to cheapen and perfect the illustration of books.

I welcome you to the Smithsonian Institute, whose distinguished Secretary stands foremost among the sons of men in his researches upon the violet and the ultra-violet rays of the sun. You will do well to look into the humble shed upon the south side of the great building, where Professor Langley prosecutes his great researches upon the physics of the sun.

I welcome you to the National Museum, in which you will see the unfolding of our crowning arts and industries. By your generous contributions of the

Daguerre monument you have joined this scientific brotherhood, whose aim is to preserve the material evidences of human history. It is to be hoped that your interest in us will not die with this moment, but that, as in Fishery Hall, the Hall of Naval Architecture, the section of transportation, the music series, you will see what can be accomplished in the history of photography.

I welcome you in the name of the Director of the Museum and his staff, who will with the greatest pleasure favor and foster your visit.

I welcome you in the name of Mr. Smillie, whose beaming countenance, wreathed at this moment in smiles from his chin to the nape of his neck, betokens the gladness of his heart at your coming.

The whole city is glad to see you. May every moment of your stay be happy; and when you go, we, like Enoch Arden, shall yearn to see your face again.

REPORT ON THE PROGRESS OF PHOTOGRAPHY.

BY W. H. H. CLARK.

[Read at Washington Convention.]

WERE I permitted, in this report, to make a reminiscence of but ten years, and had before me an audience ignorant of what has been accomplished by the aid of our art during the interim, this report could be made to sparkle like the diamond in crowning the progress of photography; but, alas! I have but twelve short months from which to formulate this report, and an intelligent and progressive audience to sit in judgment.

Photography is ever progressive, and ever will be, and although that progress may be rapid, comparatively speaking, the world probably never will be so overwhelmingly astonished by any announcement of the progress of our art as it was when Daguerre's discovery was first made public. Now and again a slight ripple across the photographic horizon is occasioned by the announcement that photography in natural colors is an assured success.

Recently an Austrian, Herr Verescz, announced that he had made a decided advance toward the solution of photography in colors. His operations, however, are based upon the researches of M. Cary Lee on the photo compounds of silver salts. It remains to be seen whether any decided advance over the latter has really been made.

Pigment printing in one or several colors has long been successfully accomplished, and I am reliably informed that Mr. H. H. Snelling, in his early days, was a practical experimentalist in this direction, and is to-day in possession of practical formulas for producing the colors by pigment printing; but owing to reverses in fortune and long-continued sickness, and to being now almost totally blind and broken down with age, he has been unable to successfully bring before the fraternity his invention. It will be remembered by the older members of this association that Mr. Snelling for a number of years successfully edited and published *Snelling's Photographic and Fine Art Journal*. If it would not be considered out of order in this report, I would suggest to the members present to have appointed a committee of as many or as few as is deemed advisable to investigate the claims of Mr. Snelling, and, if found of sufficient value, to purchase the same in the name of the Photographers' Association of America, to be published for the benefit of all.

The invention of Frederick Eugene Ives, of Philadelphia, which was patented the 22d of last month, is undoubtedly a step in advance in photographically rendering the colors, and possibly may prove a great one. The invention consists in a method of producing a set of (three) photographs of an object or landscape which can be subsequently used for the production of a helio-chromic picture. The Ives patent consists of an apparatus or camera whereby three negatives of the same subject can be taken simultaneously, the light passing at the same time through three different color screens or mediums, a full description of which cannot be rendered in this report. While this invention of Mr. Ives may become of great value and use, it is hardly to be expected that it will be of general practical utility in the hands of every photographer.

Orthochromatic photography has not made the advance that was hoped for it, and no marked improvement has been accomplished since last year. Much, however, is hoped for in this direction.

Whether or not we can rightfully call photography an art, it is, nevertheless, the handmaid of art, and in the hands of an artist-photographer, fine-art productions can be produced, but your committee cannot report the progress in this direction that some of us had hoped for. The insane practice of rate-cutting has reduced many bright lights in the photographic world to near the level of a common shyster, and with prices insufficient for a decent living, the quality of the work delivered to their patrons is anything but promising. I have visited a good many of the first-class galleries of the land, and the work there seen palmed off on the public as first-class was really shocking.

In a great measure photography is superseding drawing with the pencil, and artists are making more use of the camera as an aid in producing the outlines of their sketches and models.

While there have been some improvements in lenses and lens mounts which are no doubt of great importance, much yet remains of accomplishment before the maximum of our desires is reached. In lens mounts aluminium or aluminum appears to be the coming metal, owing to its great strength and extreme lightness; also its freedom from tarnishing.

The announcement was recently made of the invention of a lens that will be in focus for any and all distances, the same as the human eye; I am not, however, prepared to state this as an accomplished fact. As perfect as our lenses are, their full powers are not always understood, or brought into requisition by those using them. Often this is occasioned by a too short operating room. The lens in use cannot be removed a proper distance from the subject, hence an exaggerated perspective; and right here I will quote Dr. Vogel, in Anthony's "International Annual" for 1888, which may prove of value to the progressive artist-photographer. The Doctor says:

"Artists place their models always higher than they stand themselves. Photographers, on the contrary, do the reverse—that is, the former are generally in a higher position than the sitting person. Photographers give for this an optical reason: with full opening of the objective, face and hands can be brought out with more sharpness in a sitting position if the apparatus inclines toward the front.

"But we should not be forced any more to this necessity. With the use of our present highly sensitive dry plates, and the application of smaller diaphragms, we ought to be able, particularly with the application of our improved cameras, to obtain hands and face sharp without inclining the apparatus.

"It is, therefore, a question whether it is not time now to adopt the arrangement of the artists."

Electricity is coming more and more to the front, and being brought more and more into intimate connection with photography. We have it now for lighting our studios, also the subject to be photographed; for printing by enlargement, for heating the burnisher and furnishing power to operate the same; but the subtle fluid, so little known and understood by man, is destined to play a far more important part in connection with photography in the very near future. Balloon and kite photography, now successfully accomplished, would not be possible without its aid.

Photography applied to the sciences becomes more varied and numerous each year. Without doubt the most astonishing results over all of the sciences have been produced in astronomy by the aid of photography. *Ad astra per aspera*—to the stars through difficulties.

A photographic marvel is, that after an exposure of thirty-three minutes the same instrument which renders visible to the human eye stars of the fourteenth magnitude, which in the entire heavens would register about 44,000,000 of stars, shows to the photographic eye 134,000,000, and on an exposure of one hour and twenty minutes would throw before the astonished gaze of the beholder a luminous dust of 400,000,000 stars. Never before in the history of humanity

has man possessed the power of penetrating so profoundly into the depths of the infinite.

Photographs of the star Mizar, in the handle of the Big Dipper, show that star to be double, or that there are two suns too close to be separated from the star by any telescope, and it was noted that on certain occasions the lines in the spectrum of Mizar were double. After continued photographing it was found that the lines were doubled once in fifty-two days.

The star Menkalina, the second in magnitude of the constellation Auriga, has also been found by photography to be double.

I have received from Mr. S. W. Burnham, of the Lick Observatory in California, some beautiful examples of photographs of the Milky Way, the Corona during a total eclipse of the sun, and other celestial bodies, as photographed through the great Lick telescope. In this connection it will be interesting in showing the progress of astronomical photography by quoting from a report on "Celestial Photographs," by E. E. Barnard, M.A.:

"Two negatives were made of the great nebula of *Andromeda*, with exposures of three hours, fifteen minutes and four hours, eighteen minutes. Throughout these exposures, as in the other cases, the eye was kept constantly fixed on a star bisected by cross wires in the eye-piece, and the clock controlled by the slow-motion rods. Both negatives clearly show the dark spaces and the nebulous rings that were first shown to exist by Mr. Roberts in his exquisite photographs of this nebula. The rings of nebulosity are seen at a glance, though the image on my negative is on a small scale, the full extent of the nebula covering one inch. I tried to see these with both the 12-inch and the 6½-inch, but without success, though the so-called 'canals' on the north side are clearly seen in both instruments.

"In studying the distribution of the stars in space and the structure of the Milky Way it is clear that any legitimate means of exaggerating peculiarities, or rather of bringing them out more strikingly, is greatly to be desired. It would appear that the best way to do this is to photograph large areas of the sky, so as to include enough material. If, now, we reduce this to a small scale, relations that would otherwise escape the eye are brought prominently forward. Acting upon this idea, I have made reduced copies of the above negatives. The result is striking. In the Milky Way pictures the cloud-like masses of stars stand out more boldly, and their forms are more definite than in the original. Reduced in this way, the picture of the region of the *Andromeda* nebula is singularly beautiful, and it shows in a most remarkable manner the peculiar structure of that part of the heavens. The intricate arrangements of the stars in rings and segments are thus shown as nothing else can show them.

"Previous to these experiments, at Professor Holden's suggestion, I had attempted to photograph the Milky Way with a 1-inch (9 inches focus) Voigtlander lens mounted on the 12-inch and the 6½-inch telescopes at different times. These exposures—running up to an hour and a half—showed absolutely no trace of the cloud-forms that are so striking to the eye. The plates were, however, literally sprinkled with stars, most of which were beyond the reach of the eye alone and therefore much less bright, than the Milky Way itself. The sensitive plate was not deceived by a quantity of light, as the eye was, but as its action depends upon the intensity of the light it had gone to work systematically to pick out the individual stellar points of the Milky Way. Of course, we know if it had had time enough it would have finally begun the impression of the luminous groundwork. Nothing could show more beautifully the difference between intensity and quantity in the action of light upon the sensitive plate than these attempts to photograph the Milky Way."

The great Lick telescope is now supplemented by a remarkable piece of mechanism, an eye-piece which has just been completed, outrivaling anything of the kind before made. The largest before in use was not over 2 inches in diameter, while the new piece measures over 3 inches. The light from the heavenly bodies seen through the Lick telescope and this new eye-piece will be two thousand times as bright as that seen with the naked eye.

With the increased powers of the new telescope now in process of construction for the University of Southern California we may look for still greater advances in stellar photography. Mr. Alvin G. Clark, probably the most famous optician in the world to-day, has received the glass for the 40-inch objective, and which weighs two tons.

For the sum of \$108,000 he agrees to make the telescope complete, both visual and photographic.

When it is remembered that with the Lick 36-inch glass the moon is brought within about 100 miles of the earth, with this new power in the hands of the astronomer we may almost expect to be able to photograph the inhabitants on that satellite, providing, however, they remain sufficiently quiet during the lengthy exposure.

In the department of photo-mechanical printing there is nothing new to report, but the application for process blocks is rapidly on the increase.

The photographic interviewer is coming to the front. Our large metropolitan dailies now photograph a man's gestures while he is being interviewed, and from the negatives process blocks are made which are printed with the report, rendering increased interest in the interview.

Photographing lightning flashes, cloud-effects, and meteorology; of drops of water while descending, of the effects of electrification of jets of liquid, of cannon and rifle balls in their flight, of wave-sounds produced by the human voice; photographing the bottoms of oil wells, and at the depths of the deep blue sea discovering the condition of wrecked vessels, etc., etc., all go to show that photography is progressively advancing in all directions.

Animal photography, under the leadership of Messrs. Muybridge and Anschütz, is making rapid strides. With results exhibited in the Zoetrope, the exact motions of the galloping, trotting or running horse, birds on the wing, etc., are rendered in motion true to life.

Cameras.—This part of the photographer's apparatus is being multiplied indefinitely, but hand cameras, erroneously called detective, take the lead, and there are some of wonderful make and extraordinary construction, and through them film photography is rendered nearly to perfection.

In the April number of the *St. Louis Photographer* are published cuts and a description of a machine hand camera which is operated by a crank, *à la* hand organ, and capable of taking a continuous series of negatives of street life in action, making a large number of exposures per second. The inventors have also invented a lantern whereby views taken with the machine camera can be projected on to a screen where street scenes full of life and motion can be viewed in an enlarged form.

The automatic portrait machine is another wonderful contrivance, a drop-a-nickel-in-the-slot arrangement; the pictures produced are ferrotypes, commonly called tin-types. Although it is a wonderful piece of mechanism, the first cost of the machine, and constant attendance, coupled with the extremely low price of photographs, render it doubtful if it ever pays the interest on the capital invested. It is a novelty, and as such will soon pass into oblivion.

The educational side of photography has made little or no progress in this country. Germany is, without doubt, in the lead over all nations on the globe in the respect of photographic educational facilities. Dr. H. W. Vogel is professor of an efficient school in Berlin. Zurich has its photographic laboratory, Herr W. Cronenberg is professor of a technical school at Schloss Gronenbach. Austria has a splendid institution dedicated to photography, under the professorship of Dr. Eder. All of which have students from all over Europe and different parts of England and America, while here in America we have a bud or two which are trying to blossom, and have, no doubt, done much good.

Quoting the President of the Photographic Society of Great Britain, Mr. C. H. Bothamley says:

"It has been proposed to found a Photographic Institute in this country, and we shall all be agreed that, founded on a right basis, and conducted on right lines, it might be of incalculable benefit to photography. Founded on a

right basis and conducted on right lines—that is the essence of the whole matter, so far as possible success is concerned. An Institute of Photography, I take it, should teach and examine and conduct original research. It might possibly also act as a court of arbitration in disputes involving technical matters, but the advancement of photography in all its branches and aspects, by teaching and research, should be its chief business. It should be thoroughly, though not ambitiously, equipped; it must be free from connection with commercial interests of any kind; above all, it must be free from the immaturism which so often clings round present-day amateurism.”

To which we should all say amen, and hope that a similar movement may soon be started in this country.

Under the head of developers and development your committee has but little to report. Eikonogen has taken a pretty strong hold upon the craft, and is, perhaps, to-day used more extensively than any other agent for inducing the latent image to make its appearance on the exposed sensitive plates, and after the day's work is done the photographer can write his letters and figure up his profits or losses with spent eikonogen developer for ink.

I am sorry not to be able to report progress in producing durable albumen prints, but the reverse appears to be the order of the day. It is patent to all that the albumen prints of to-day are not as durable as those made twenty years ago. I would also be glad to incorporate in this report an infallible remedy for that pest, blisters on albumen paper. Many remedies have been published, but in spite of them all, the trouble will now and again appear in the best-regulated galleries. Is it really in the paper or the workman?

These may be minor subjects considered in the light of the more exalted questions concerning the progress of photography, still they are important factors in connection with our progress. And it is to be hoped that the day is not far distant when these evils will be overcome.

ADDRESS OF PRESIDENT J. M. APPLETON AT WASHINGTON.

Ladies and Gentlemen of the Association: With mingled feelings of pleasure and pride I greet you to-day in this our eleventh annual convention.

Of pleasure because that through the goodness of an all-wise Providence are we again permitted to come to the occasion of the year—a time to which the progressive photographer looks forward with great anticipations of cordial greetings and fraternal handshakings, of the renewal of old and the forming of new friendships. An annual feast of good things, the fruits of our year's labor, which we have brought together for emulation and enjoyment. A sort of photographic “Harvest Festival.”

Of pleasure because of the indications I see in your faces of good-will and harmony, which are so important and essential to the greatest good for our Association.

May this so continue, even more and more, until as one man we stand, with but one aim—the advancement and elevation of photography, and to this end may all selfish purposes be sacrificed and progress be the motto of all.

Of pride because of the privilege of presiding over such an assembly, and at this the first convention we have ever held in this beautiful and queenly city, our nation's capital and pride.

Of pride because I am a member of the greatest photographic association in existence, and the one capable of the most good, and shall be proud to know, if that from the deliberations and work of this convention may spring new thoughts, new incentives and plans, that shall lead to greater achievements, better work and aid in ennobling our beautiful art and science.

Much has been said and written toward the securing of better prices and a general bettering of our condition.

Associated efforts have been tried, and yet all to no purpose.

Careful consideration has led us to the conclusion that such things are largely

controlled by the law of demand and supply, and all efforts to remedy through any other channel are worse than useless.

Cheap prices have prevailed for several years, and the public is surfeited, and is now demanding a better and higher order of work. Are we prepared to furnish it? Are we making such work as requires the utmost skill and care, and just such as *any* man would have to charge a good price for?

I do not say that there has been no advance made among us since we last met, for we see evidences about us to the contrary; the beautiful photographic art productions to be seen at this exhibition show that somebody has been studying, somebody has been working and advancing, during the year.

But in this busy, busy world, when photography seems to be permeating almost every known science and art, and men of science, education and talent are working at it incessantly, it behooves us to look well to our laurels as professionals, and apply ourselves most diligently to study and work, that we may keep to the fore, or we may find in the near future our occupation gone.

Realizing, then, that what we most need is advancement to a higher plane, to a more extended knowledge and art education, we have arranged to have the work done of this convention along this line. So in order that we may get the most possible benefit, let us each be in attendance at all the sessions devoted to this.

Our "practical talks" will be introduced by short papers on the subject, to be followed by discussion. If you have anything to offer, do so, and make it to the point.

Do you want to know, ask through the question drawer—no doubt some one present can answer.

Our "art lecture" will be the criticising of photographs which have been kindly contributed for that purpose, and fairly represent the standard of American photography.

These criticisms are intended to point out to us wherein we have failed from an artistic standpoint, and we hope will prove to us an excellent object-lesson.

While we do not claim to have the best possible programme, yet hope you will recognize it as being in the right direction, and if it meet with approval, that it may be followed up another year still better, and so from year to year may we progress toward a more intelligent photographic culture.

Of our financial condition I need not say more than to refer you to our Secretary's and Treasurer's reports.

Will say, however, that in round numbers we have deposited in bank in Chicago \$2,013, which may be a matter of interest to some.

Considerable has been said during the year of the advisability of merging the offices of Secretary and Treasurer into one. This, you know, requires a change in the Constitution, and must be offered at one session to be voted on at the next. Now, if it be your pleasure that such change be made, I would recommend that an amendment to that effect be offered at this session to be voted on to-morrow morning, and then your Nominating Committee could report in conformity therewith.

I desire now to respectfully call your attention to a matter which has been mentioned a number of times, but toward which nothing has yet been done. I would recommend that active steps be taken at this convention to reach the desired end, if in your good judgment it is deemed wise and best.

I refer to the securing of a permanent home for the Photographic Association of America.

Our conventions, if they do the good they are designed to do, must necessarily be expensive, more or less, according to location and circumstances. And as the Association grows older, if it increases and enlarges its sphere of usefulness, we can reasonably expect the expenses to increase.

Now we hope you will be considerate enough to allow that your officers each year conscientiously do the best they can to insure as profitable and successful conventions as possible within our present circumstances.

To reduce expense and increase our surplus, as I understand it, is the great desideratum, with the object in view, of course, of being permanently located

some time and better equipped for work. But this seems an impossibility under the existing order of things.

Now, we think that the money that could be saved each year by being so situated, coupled with what could be raised with a fair effort on the part of each, would secure for us just such a place as we need, and where our expenses would be light and we could soon have money to devote to scientific and artistic improvement.

Studies and laboratories could be built then where practical demonstrations could be made each year.

A school might be established and a collection made and placed there permanently, showing from year to year the progress of photography.

Such a place, if properly located, could be made a source of revenue by renting parts of it, at least, during the year.

And in a few years at most we could be firmly established as one of the educational institutions of the world.

Then could our Association grow into its destined usefulness. This in turn would have its reflex influence for good on us all at our homes.

Now I hear you ask : How can this all be accomplished ? How started ?

Let me suggest. But before doing so I want to say in justice to others that this plan was suggested to me, and thinking well of it, I herewith submit it.

A crude plan is something like the following :

Let stock be issued, say at \$25 per share, without dividend or interest for five years, each man holding one share being entitled to all the Association privileges during that time. We should think one thousand men at least could be induced to take one share each or more.

Now, if our manufacturers and dealers—of which one hundred could be found—would take ten shares each on the same terms, this, together with the one thousand one share men, would net the sum of \$50,000, which we think would build and start the concern, and to this could be added at any time bequests. Possibly some one present would like to make one.

The saving to the dealers and manufacturers of the annual expense of fitting up their stands for exhibits would be quite an item toward their stock, for they then could fix their locations permanently.

I am told that this Museum building cost about \$150,000 ; a building one-fourth the size of this would be ample, or at least until the Association should become so wealthy and large as to require something more congenial.

These, of course, are only suggestions for a general plan which a committee could work out in detail. But I think it of sufficient importance and interest to be worthy of your consideration, and so submit it, hoping that you may think favorably enough of it to take decisive steps toward it at this convention, and that from it may come something that will result in a lasting benefit, not only to ourselves, but to those who are to follow. *Then* shall we as an association have existed to some purpose.

POST MORTEM PHOTOGRAPHY.

It is rather rash to depend upon what is called a *post mortem* photograph as evidence of identity. A curious incident has just been reported. Some six months ago a man was found dead in bed in a common lodging house in South-wark. The body was photographed by the police, and buried as unidentified. About a month ago, a woman whose husband had been missing for twelve months was shown the photograph at Scotland Yard, and at once identified it as being the portrait of her husband, who was insured for £17. She forthwith made an affidavit, obtained the money, put on widow's weeds, and mourned her husband as dead. About a fortnight since she was startled by her husband—who had been to America—reappearing, and it is only fair to the widow to say that she at once recognized him, and received him in the most affectionate manner. The most disagreeable part of the business will probably be the returning of the £17.—*Photographic News.*

OUR ILLUSTRATION.

IN this issue of the BULLETIN we give a capital life-like portrait of Mr. W. Townsend Calbron, the genial ex-President of the New York Camera Club, who is well known as a most painstaking and successful amateur. The negative was made by Dr. Piffard, at the Camera Club rooms, with a 13½-inch Dallmeyer rectilinear landscape lens, a lens which the Doctor writes us he greatly prefers to a rapid rectilinear for portraiture, and for flash-light exposures in connection with his scientific professional work.

AWARDS OF PRIZES AT WASHINGTON CONVENTION.

ASSOCIATION PRIZES.

- GRAND PRIZE To G. H. Hastings, Boston, Mass.
 CLASS A To S. L. Stein, Milwaukee, Wis.
 CLASS B *Gold medal*, to E. C. Dana, New York City.
 Silver medal, to J. Landy, Cincinnati, O.
 Bronze medal, to O. P. Scott, Chicago, Ill.
 CLASS C *Gold medal*, to W. Stuber & Bro., Louisville, Ky.
 Silver medal, to J. E. Stimson, Appleton, Wis.
 Bronze medal, to Theo. Heinig, Dayton, Ohio.
 CLASS D { *Gold Medal*, to Heimburger & Sons, New Albany, Ind.
 Landscape . . . { *Silver medal*, to Miss E. C. Sears, Boston, Mass.
 Bronze medal, to J. Zybach, Niagara Falls, N. Y.
 Marines *Silver medal*, to Allen & Rowell Company, Boston, Mass.
 Architectural . . *Silver medal*, to E. W. Lincoln, Cambridgeport, Mass.
 Bronze medal, to G. H. Hastings, Boston, Mass.
 CLASS E *Silver medal*, to F. S. Clarke, Rome, N. Y.
 Bronze medal, to C. P. Wilcox, Boston, Mass.
 CLASS F *Silver medal*, to W. G. C. Kimball, Concord, N. H.
 Bronze medal, to Rothengatter & Dillon, Philadelphia, Pa.
 CLASS G *Silver medal*, to C. H. Codman & Co., Boston, Mass.
 CLASS H *Gold medal*, to Lafayette, Dublin, Ireland.
 Silver medal, to Gothiel & Sohn, Königsburg, Germany.
 Bronze medal, to J. Hanna, Auckland, N. Z.
 DIPLOMA To Benjamin Bros. & Wiener, Cincinnati, for burnt-in enamels.
 To Ullmann & Co., New York, for pastel and oil portraits.

ANTHONY'S PRIZES.

- First Prize, \$100, to C. W. Motes, Atlanta, Ga.
 Second Prize, \$50, to A. A. Knox, New York City.
 Prize for negatives on climax films, \$50, to C. E. Vredenburg, Elizabethtown, N. Y.

AIR BRUSH PRIZES.

- First Prize, an air brush, to P. Fleming, Chicago.
 Second Prize, an air brush, to C. Y. Waldeck, St. Louis.

WIBBLE.—“I wonder why swans sing just before death?”

WABBLE.—“It is their last chants, I suppose.”

an amateur can do in photomicrography, proved exceedingly interesting to the audience. A brief scientific lecture was delivered upon each view.

There were many other views, scientific, pastoral, comic, serio-comic and pathetic, many of them giving undisputed evidence of genius among some of the members of the Oakland Camera Club. The audience enjoyed the evening and went away well pleased.

Those who had views on exhibition in the hall yesterday were: A. J. Gray, H. L. Adams, John Young, Frank Rudolph, G. H. Carlton, H. P. Carlton, Miss Gertrude Carlton, Miss E. T. Mastiok, Miss H. McLean, Charles D. Perine, Chester Deering, G. P. Clough, Rosco Bromley, Miss L. Gove, W. H. Rabe, E. R. Drew and L. J. Hassler.

CALIFORNIA CAMERA CLUB.

An illustrated demonstration, by George W. Reed, of the platinum process, was the feature of the meeting of the California Camera Club July 8th, at which a large number of ladies and gentlemen were present. The lecturer explained the system as one very much more beautiful and effective than the bromide process, illustrating his remarks by significant comparison of specimens of the two prints. He declared it to be the only process of extensive use at present in vogue in England and continental Europe, where the results attained are of the most satisfactory character. The gentleman was frequently interrupted by appreciative applause and questions relative to the practical application of his suggestions.

The Club decided to give a public lantern exhibition, entitled "Illustrative Chicago," during the latter part of this month. The exact date was not fixed, as it will depend upon the arrival of the Chicago Camera Club, under whose direction it will be given, and whose members will not arrive in this city until two weeks hence. The success of the last public exhibition given in this city has inspired the members of the Club to direct their energies to scenes of local interest, and it was announced last night that a series of illustrations of places in and about San Francisco was in course of preparation. Upon completion it will be used for exchange with similar organizations. A trip to Yosemite will also be soon undertaken.

Plans of the new building of the California Academy of Sciences were submitted last

night, and it was decided to rent suitable apartments, which will be ready for occupancy at the beginning of the year. All of the necessary apparatus to pursue all branches of photography and elaborate exhibits of amateur work will be placed in the rooms, the appointments of which it is intended shall be in every way complete.

The following delegates were elected to attend the convention of the World's Fair in Metropolitan Hall on September 11th: Captain I. E. Fair, Fred C. Torrey, Fred B. Chandler, I. W. Taber and James C. Pennie. Henry Schwerin was elected an associate member.

ST. LOUIS CAMERA CLUB.

ANNUAL FIELD DAY.

THE St. Louis Camera Club recently had its annual field day, with competition for prizes, and the awards have just been made. Glencoe was the place visited. This is a pleasant town nearly thirty miles from St. Louis, with the Meramec River at its doors, and the entire surrounding country abounding in splendid scenery. The club's representation was about two score members, among them being R. E. Collins, President; Father Cherroppin, Dr. C. V. S. Ludwig, Dave Aloe, Joseph Widen, J. W. Dunn, E. C. Jewett, C. W. Melcher, Ernest Cramer, J. S. Samborsky, F. H. Fletcher, W. J. Thorn, and others. The party was warmly welcomed when reaching its destination, the residents doing all possible to make the outing a happy and successful one. Among the courtesies shown was a dinner tendered by the Glencoe Manufacturing Company. Each club member made from six to twelve exposures, and the light being at its best fine results were obtained.

Five prizes were offered. The first was a \$30 Aloe lens; the second, a camera level; third, six dozen dry plates; fourth, package of developer, all put up by A. S. Aloe & Co., with the fifth, a booby prize of 1 pound of pyrogallie acid, offered by the Davy Chemical Works. The first prize was made open to all, but the others were only to be contested for by amateurs who had practiced less than one year. One of the conditions was that each contestant should personally carry through all the details of developing and printing, the negatives to be submitted as well as the prints. Three judges were selected. They were F. W. Guerin, photographer; M. A. Seed, of the Seed Dry Plate Works, and G.

Cramer, of the Cramer Dry Plate Company. Each contestant had the privilege of submitting all his work at Glencoe if wished, or could let his merits rest on one selection. The first was the plan accepted by all. The judges rated each negative and print in the different entries, their decision being determined by the totals. The subject, development, definition and printing were the principal points considered. The first prize was taken by J. S. Samborsky, second by Dave Aloe, third by F. H. Fletcher, fourth by W. J. Thorn. The name of the winner of the booby prize was made a matter of Club confidence.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

ELEVENTH ANNUAL CONVENTION.

AT 10.30 o'clock A.M., August 12, 1890, the *President*, Mr. J. M. APPLETON, called the Association to order and said :

Through the courtesies of the officers of this institution, the National Museum of the United States, are we so pleasantly situated to-day. I take great pleasure, therefore, in introducing to you Professor Otis T. Mason, Curator of Ethnology of this Museum, who will bid us welcome.

Mr. O. T. Mason then addressed the Association. (See page 494.)

President—Professor Mason, I know that I voice the heartfelt sentiments of this Association for you when I extend to you our thanks for your very kind welcome, a welcome that is a welcome indeed. We have to-day, I hope, formed acquaintances which will widen and deepen into lasting friendships, and that we shall catch, from our association with these gentlemen, an inspiration that will result in greater achievements in our profession.

On motion the roll call and the reading of the minutes of last meeting were dispensed with.

President—Mr. W. H. H. Clark will now report upon the progress of photography.

Mr. W. H. H. Clark then addressed the meeting. (See page 495.)

President—We will now have the reports of the Secretary and Treasurer.

Report of the Treasurer and Secretary read and accepted.

President—Our next will be the report of the World's Fair Committee.

Dr. ELLIOTT—I do not think anything has been done. The Committee has not had a meeting.

President—We have two telegrams, which the Secretary will please read.

LONDON, August 12, 1890.

To President Photographers' Convention,
Washington, D. C.

Best wishes for the success of eleventh Photographers' Convention.

JOHN CARBUTT, London.

TOLEDO, O., August 12, 1890.

To J. M. APPLETON,

President Photographers' Convention of America, Washington.

The Toledo Photographers' Association send greeting to the Photographers' Association of America.

Fraternally,

W. E. McKECKNEY, *President.*

W. F. VAN LOO, *Secretary.*

President—We now come to the selection of a location for our next convention. I hope, in presenting the names for location, that you will be qualified to say something definite concerning the city you name, so that the committee may be able to know what they are doing and to find no trouble in their selection of a building for the meeting. We are now ready for nominations.

W. H. H. CLARK—I have for two years past advocated the city of Detroit, as you probably know and remember. I cannot be positive, as President Appleton has requested, and hope that some one may be here from Detroit that can be positive, although I am very sure that we will be taken care of. They have a new Exhibition building, and I understand the objection is that the building is too far away from the city. Gentlemen, that is just what we want. The Exhibition building is about seven miles from Detroit. Transportation is splendid, both by rail and water. About two years ago the Missouri Press Association held its meeting out in the country, at the Springs, where we had the most successful meeting we ever held. We have got into Washington, and I doubt not there are twice as many photographers in the city as are in the meeting. I guess you have got them, for there are double the number that are here. When they come to Washington they want to see it. Time is short. Detroit is a beautiful city. It is a small city, but one of the most beautiful cities in the country ; plenty of opportunity for having the best of sessions. Whether the Exhibition building could be got or not, I do not know. I would like to hear from others. I nominate Detroit.

(The motion was seconded).

W. V. RANGER—Mr. President, I wish to offer one city in nomination which has had the most successful financial Convention of this Association, and that is Buffalo. It is accessible from every part of the Union. Every line of railroad gets into Buffalo; they spend millions of dollars to get into Buffalo. It is central from east to west. They have the hall and everything is favorable, and financially every Convention has been successful in Buffalo. In 1886 we had the best Convention we have had in years. It is easy of access to the west and east. We have a large hall, the 56th Regiment Armory, where everything is arranged in good shape. The Convention attracted attendance from all quarters; it brought all the eastern trade, being the Grand Trunk center; it brought in all our western friends. It is in the great State of New York, near the city of Washington and the States of Pennsylvania, Connecticut and Massachusetts, and all are easy of connection to Buffalo.

President—Are there any more nominations?

Motion that the nominations be closed. (Carried.)

President—If that is your pleasure, we will not put the motion. You have now before you two cities, Detroit and Buffalo. All those in favor of going to Detroit will signify it by saying "Aye;" contrary, "No." (Lost.)

Mr. DECKER—I call for a division. I move that the selection of a location be postponed until to-morrow's session.

(Seconded.)

Mr. DECKER—There are few here; there will be many more here to-morrow morning, and I think they can make up their minds by that time.

President—We will have to take the vote upon Buffalo, as there has been a motion to that effect.

Mr. DECKER—I made the motion that we have the division vote on that question.

President—All in favor of going to Detroit next year, will signify it by rising to their feet. Those opposed by the same sign.

(Motion is lost, 44 against 37.)

Now we will take the vote on Buffalo.

Mr. DECKER—I made the motion that ought to be put before this, that the matter be postponed until to-morrow.

A Member—I see no other reason why we should postpone the consideration this morning. It is published on the programme here. We have already taken a vote on the question upon the holding the Convention in Detroit, and it was lost. Shall we hold the Conven-

tion at Buffalo or not? There are enough matters to be discussed during the next few days that will take up the time of this Convention. The proper time is now to vote on this question.

(It was suggested that as so few of the representatives from Detroit were present at this session, it be postponed until to-morrow.)

A Member—Is that fair? Detroit has been voted on. If the Detroit representatives are not here, is it right that we should wait for them? Why not have a vote on Buffalo?

President—We now put Mr. Decker's motion, that this election be postponed until to-morrow morning. (Motion lost.)

President—We will now vote upon Buffalo. All those who are in favor of Buffalo as the next place of meeting will signify it by rising. Those opposed by like sign. (Carried.)

President—I will now appoint as the Committee on Nominations for Officers for the ensuing year: Mr. E. J. Pullman, Washington, D. C.; C. W. Motes, Atlanta, Ga.; F. W. Guerin, St. Louis, Mo.; John Hood, Philadelphia, Pa.; E. P. King, Providence, R. I.

The Committee on awards:

On Grand Prize—C. W. Motes, Atlanta, Ga.

Class A—C. W. Canfield, New York.

" B—E. P. King, Providence, R. I.

" C—John Schneider, Columbus, O.

" D—L. C. Overpeck, Hamilton, O.

" E—Theo. Heinig, Dayton, O.

" F—E. Decker, Cleveland, O.

" G—A. H. Plecker, Lynchburg, Va.

" H—W. G. C. Kimball, Concord, N.H.

" H—S. L. Stein, Milwaukee, Wis.

" H—Prof. Thos. W. Smillie, Washington, D. C.

There is one other matter I wish to call to your attention. The authorities in this institution have kindly offered to keep an information bureau, where you can leave your names, stating where you are in the city, so that friends can find you. This bureau you will find on your left in the hall. You have to simply write your names on a piece of paper, which you can do at any time, and refer to the books to find your friends.

President's annual report. (See page 499.)

President—I wish to say to the Nominating Committee, that if there is anything done in regard to the change of the Constitution on the merging of the offices of Secretary and Treasurer into one, you can select two men for the two offices or one man for the one office, as the case may be, and have them ready to nominate to-morrow morning. What is the opinion of the Convention on the

amendment? We shall be glad to hear from you, either for or against. I would say further, that this matter has been urged with a view to economy and cutting down of our expenses. You have now an opportunity to express yourselves.

Mr. DAVIS—I move that the office of Secretary and Treasurer is merged into one. (Seconded.)

W. H. H. CLARK—I do not like to have all the say on this subject, as it is well known the position I take. It seems to me from my observation for many years that this thing may be accomplished. It cannot be accomplished without a change in the Constitution. The suggestion also made by the President, on a permanent home, is well put, and which we hope to see. The first subject is economy. I think it can be well worked in these two offices. It certainly can be worked by one man and that one man should be paid a stipulated sum, not a percentage on the receipts. He should know what he gets, and he will be aided by the officers from year to year. It is an honor to be elected to any office of this Association. These gentlemen have filled it with merit to themselves; but if one does not work, you can get plenty of men to work for the honor of being first or second Vice-President. The work can be conducted by one man; that one man paid a stipulated sum. We may then economize and prepare for the future home. Mr. President, I am highly in favor of the consolidation of these two offices.

Mr. CRAMER—Before we put this motion I would remark that, as long as the Association has been in existence we have always had the two offices. Then it appears to me that it will be difficult for one man to assume its duties during the Convention. The Treasurer is at his office; how can we have him at the meeting at the same time? Formerly we paid these officers each 5 per cent. of the receipts, and during my administration at the Convention of Chicago the salary was, upon motion, raised to 10 per cent. Now, might it not be as good economy to go back to the old rate of pay instead of piling up too much work upon one man; work that he is not able to do? There are other things the Association can economize in—select a Secretary who can attend to the business of the Convention. This voting upon a place of meeting was not customary, but it was adopted in order that the officers selected should not be a thousand miles off, and it can save you lots of money. I think instead of trying to combine the two in one, we should rather cut down the salary.

W. H. CLARK—I would like to answer Mr. Cramer in one remark. I always like to differ with Mr. Cramer. The Secretary or Treasurer can take his stand here; those who are not on hand can wait. One man can attend to it. Those who delay must come to the Association terms.

Mr. OVERPECK—It looks to me that if these offices are filled by those who have other duties, it is too much to ask those who are so unfortunate as to come a little late to remain outside until the sessions are over. I will be in favor of cutting down the expenses by lowering the salary.

President—When you merge the two offices into one, you would necessarily have to create a third Vice-President, in order that your Executive Committee might consist of five, a very proper number.

Mr. CRAMER—I do not wish to take up too much time. I think it an important matter before the meeting, and I should like to hear those who are acquainted with the work. When the meeting takes place there come calls for the Secretary. New members are coming in fast, fifty at once, and they all call on the Secretary to get their receipts, and to aid them in other ways. Our brother Carlisle is filling his post like a soldier; he hardly has a chance to participate in the meeting. How can the Treasurer also attend to the duties of the meeting. I do not see how it is possible. If you would select your officers according to the place of meeting, always select your Secretary in the place of meeting; there is where you can save and you can save in mileage. There is where you can economize. I should like the ideas of others.

President—We should be pleased to hear from any who have been in these offices.

Mr. McMICAHEL—I know something about that. I do not believe it is possible to merge these offices into one and make it practicable; it is impossible. I do not believe the Association did right when they changed the 5 per cent. to 10 per cent. The officers paid their own expenses at 5 per cent. You can find all the men you want to fill the place for the honor.

Motion to lay the motion on the table. (Seconded and carried.)

Mr. RANGER—I believe the Chairman of the Railroad Committee has to sign certificates; and those who want to get reduced fare home will have to bring to me their certificates so that I can indorse them.

Mr. CRAMER—At our last year's meeting in Boston, we selected Washington as our

next place of meeting, and it was also resolved to erect a suitable monument to Daguerre, and a committee was appointed to carry out the resolution. The place selected being the Smithsonian Institution as the most proper place to erect that monument, the Committee was instructed that the monument be ready, so that we could all witness this grand event in the history of the Association; therefore, I hope that the unveiling of the monument will be attended by all the members present, in order to make it as effective as possible. I hope that the monument will be a corner-stone in the building up of our Association; that it will reflect as much honor to Daguerre as to the Association itself. Last year I obtained from our friend, Bogardus, a daguerreotype of Daguerre. All are invited to look at it. It is badly scratched. And I have long considered which would be most pleasant to the members, to have a badly scratched copy or a crayon, which is as true as possible, thinking it almost impossible to make any acceptable copy of the daguerreotype as it is. I will leave it to you how far we have copied the likeness. Professor Smillie asked if I had a picture of Daguerre, which he could add to the case of illustrating the History of Photography. He has the first instruments which were used in photography by Professor Morse; he has pictures and lenses. I told him that I would cheerfully donate the daguerreotype to his collection.

President—I would like to say, our newly found friend of this institution, Professor Smillie, has a hobby, and that is historic photography. He is endeavoring to make a collection for this Museum, showing the advances that have been made; gathering together all the early articles that will serve as a record of the history, and he would very agreeably accept of any donations that any members of the Association may have, or any articles of interest that they know of that can be procured, to place in this collection. I mention this so that you can offer him anything you have. It will be well taken care of, and will remain here so long as the institution may stand.

Mr. MOTES—I remember at the last Convention at Boston, Mr. Bogardus spoke of the first instrument ever used in the country by Mr. Morse. I think he turned it over to Albert Morse, of Philadelphia.

President—That instrument is now in Mr. Smillie's possession and can be seen in the rotunda. I have a memoranda of some of the articles he would like to have, if they can

be procured. These are a bluff wheel; 11 x 14 to 16 x 20 camera box, old date; and collections of all the photographs that have taken prizes at our conventions.

Mr. DECKER—Under the action of this Convention, taken two years ago, it is the duty of each one of the members who take prizes to donate one set of the prize pictures to the Association.

President—If we had a home of our own, these collections would be very valuable.

I have here a telegram from Cincinnati:

The Photographers' Association of America, in convention, Smithsonian Institute, Washington.

May success attend your efforts and the results of your deliberations mark an epoch in the progress of our art.

Fraternally,
J. LANDY.

(Moved and seconded that the meeting adjourn.)

President—This Convention now stands adjourned until 10 o'clock to-morrow morning.

SECOND SESSION, WEDNESDAY, AUGUST 13, 1890.

The President called the Convention to order.

The following communication was read by the Secretary:

PROVIDENCE, R. I., August 13, 1890.

J. M. APPLETON,

President P. A. of A.

DEAR SIR,—I am most sorry not to be with you. I send greetings, and hope the Convention will be a signal success.

Cordially yours,
GUSTINE L. HURD.

President—For very satisfactory reasons, Mr. E. Decker, of Cleveland, will not be able to serve on the Committee on Enlargement. I appoint Mr. A. J. Riddle, of Columbus, Ga., in his stead.

Reports of committees are in order, and first, the report of the Committee on Nominations:

For President, George Hastings, of Boston; for 1st Vice-President, S. L. Stein, of Milwaukee; for 2d Vice-President, W. Stuber, of Louisville; for Secretary, L. C. Overpeck, of Hamilton, Ohio; for Treasurer, G. M. Carlisle, of Washington, D. C.

Report of the Special Committee on the Daguerre Memorial:

Mr. MCMICHAEL—On account of a number of subscriptions that will come in between

this and to-morrow morning, we are not ready to report until that time.

The President—Any new business?

Mr. McMICHAEL—Mr. President, I have a small item to present to the Association in regard to the Torrey Bankrupt bill, and I move that a committee of five be appointed to act upon this and look into the merits of the bill, and make report of same, the committee to be appointed by the President.

(Seconded and carried.)

The President appointed, as the committee of five, the following gentlemen: H. McMichael, F. W. Guerin, William Pelgriff, William Entekin and C. W. Motes.

Mr. C. M. DAVIS, Charleston, W. Va.—Mr. President: Under that head, "New Business," I have something to offer, and for a few moments to talk on a "new" subject—a brand-new subject to the Photographers' Association of America.

And before I commence with what I have to say, I would like to read a few extracts, if you please, from this late number of the BULLETIN, July 26th.

Now, sir, I am not a "mind reader"—and, by the way, that is what I tell my customers who want "satisfaction guaranteed," something I didn't do when I was getting \$8 and \$10 a dozen, and I don't do it now when I am getting \$1.50 a dozen—yet all that is so in line, so in accord, with what I am going to say, that I am inclined to believe that the writer had in view the same object that I have in addressing you. And the *Photographic Times*, *Wilson's Magazine* and the *St. Louis Photographer* have been hammering at us on the same line for these many days, and I take it that they simply mean:

"Photographers, get together and do something for yourselves; if you don't you will be swept out of existence by the avalanche that is rapidly gaining an irresistible force and fast overtaking you."

If they don't mean that, what do they mean?

And now to my subject. And you will excuse me for reading from manuscript. I am no speaker—"only a photographer."

A subject, sir, that I believe is paramount, of more interest, of more vital importance to the members of this Association and to the photographers of America than any other that may be brought before it—whether it may be in able lectures or admirable essays relating to the lighting and posing or any other of the technique of photography—as the subject I have in my mind relates to the manhood, the well-being—to a respectable

and genteel livelihood for every photographer in our country.

I allude, sir, to the subject of prices and their regulation.

"Disconnected effort amounts to nothing; photographers should remember this fact and unite."

And when I say that I believe this subject, in the present status of photography, is of more consequence than any other that may come before this Convention, I don't think I am alone in this belief. During our Convention of last year at Boston this Association received a slap in the face from a very esteemed photographer when he said this Association had never dared to tackle the subject of prices.

We must have deserved the lick, for the assertion remained undisputed, and therefore stood as a fact—however humiliating it may have been.

I thought to myself, is it possible that with the brains that produce the elegant work that is brought here before us from year to year there are not brains enough to save photography from the "wreckers" and bring it once more back to the plane of genteel and noble professions?

Mr. President, after attending our Conventions off and on from the inauguration of the old N. P. A. to the present, it is the first time I have had the temerity to burden you with any talk of mine. There were so many who were abler and more interesting than myself to talk on the various subjects that come up before us that I felt content to listen and be a looker-on. I have learned much, very much, and have felt a deep interest in the success of this Association and its Conventions. Returning home from the Boston Convention, I began to think it was about time I was trying to do something for photography, in at least part payment for the many good things it had done for me through its conventions. Was there nothing I could say that would help photographers as I had been helped?

There occurred to me Brother Bogardus' remark that this Association had never dared to tackle the subject of prices. There's where I'll try to benefit photographers and help raise the profession of photography.

I'll tackle the subject, and if you don't stand by me it will be no fault of mine if my plan goes under. And when I say you, I mean every member of this Association, stock dealers included—for they have been urging us to do something to save photography; they

know if we are smothered by the avalanche of ruinously low prices they go under with us.

Gentlemen of this Association, let me plead to the photographers of America, through you, to work and live for the refinement of photography, and not its debasement.

My brother photographers, I don't want to think there is one here to-day who does not want to see prices brought out of the depths into which they have fallen, and with that the elevation of our art and our profession.

It is not necessary to go into details and string out before you the causes that have brought prices so low, and brought photography into its present degenerate condition. You know as well as I do that we have been placed "Twixt the devil and the deep sea" by canvassing agents and the photographic "wrecker" of the larger cities, and that their slime has extended in and out everywhere—and where's the end?

Photographers! Is it not time to call a halt? Is it not time to try to do something?

Let us do something now! right now, on the opening of this first session of this Convention, and let us keep at it until this subject of prices has been brought to a successful and satisfactory termination, "With malice toward none and charity for all."

Let us unveil a new era to American photographers while we are unveiling a memorial to our sainted Daguerre.

Whenever this subject of prices has been broached there are those who are quick to say, "It can't be done."

Well, my brother photographers, it can be done if you are in favor of having it done. And I believe, Mr. President, I have found a way out of this sewer of low prices into which we have all more or less fallen.

I believe, sir, that I have a plan which, if adopted by this Association, will bring the photographers of America to the goal they have so long sought.

There is no dynamite connected with the plan I have in view, nor is there any of the "P. and A. M. B. A." nonsense about it; nor is there anything about it that will hurt any one connected with photography—not even our scientific co-workers and friendly friends, the amateurs.

On the contrary, sir, my proposition, if adopted by this Association, will enable those who are getting low prices for their work to get better prices. It will enable those who are getting fairly good prices to get greater prices if they want them. Will that hurt anybody?

Higher still, the public—our patrons—will receive tenfold the value in enhanced quality of work, for with better prices comes the awakening from lethargy to ambition—from apathy to higher aims.

To our right bowers, the stock dealers, it will make their sales increase at least 30 per cent.—and they will get paid for their stock.

(Mr. President, I wish that every stock dealer and every plate manufacturer was present to hear that assertion.)

Topmost of all, sir, it will bring together, and in more cordial and more courteous relations, the photographers of every town and city, doing away with the jealousies and petty bickerings that have so long existed.

More than that, sir, it will knock the pins from under the "wrecker," and his occupation will be gone—that of ruining his neighbor and debauching his profession.

"But to give them power before the world, to show people at large that photographers are an important class of citizens, it is necessary that they unite to attain their ends."

Now, gentlemen, I am about through, and in anticipating your desire to know what this proposition or plan can be it may be brought before you properly only through a committee.

Will it meet your pleasure to have this committee appointed?

I thank you for your attention.

MR. BOWERSOX—I have no doubt Mr. Davis has a view which will be appreciated by this Convention, because he has made it a study to be able to write on this subject, and I move that you appoint a committee of ten, with Mr. Davis, to confer with him upon this subject.

(Seconded and carried.)

The President appointed the following committee: C. W. Davis, E. Decker, W. Stuber, D. R. Coover, E. C. Dana, H. McMichael, W. G. C. Kimball, L. C. Overpeck, D. W. Baker and A. L. Bowersox.

MR. RANGER—I would like to offer a suggestion, which I think would be of interest to this Convention and induce a greater attendance and larger membership. There are many photographers who desire a Bureau of Information; it would give help to those in need of work; it would aid the ambitious and expert ones in case they wished to change their location, or those who want to buy could do so, those who want to sell also; and those who are operators could get good situations, etc. It could be placed in the hands of the Second Vice-President, and it might tend to increase our membership. I make

a motion to that effect, and add that at this meeting I will act as the agent to receive any communications, and those who want help can leave the communications with me and I hope all will be correct. The motion is that we establish a Bureau of Information for the members of the Photographers' Association of America, to be in charge of the Second Vice-President of each Convention.

(Seconded and carried.)

President—We spoke of a Question Drawer in our programme, you will remember. And now, whoever has questions to ask pertaining to photography, upon scientific subjects, etc., will please leave them on the table, so that they may come up at our next session, at 2 P.M. to-day.

The President read the programme for the afternoon session, and said: I want to say that we have taken pains to prepare an excellent and instructive programme to fill the demands of our Association, as the complaint has been made that we have not had sufficient instruction at our Conventions—that no one can learn anything in the business.

The evening's session, one which we look forward to with a great deal of pleasure, is the art criticism to be made on photographs which have been contributed by members of our Association, conducted from an artistic standpoint.

Mr. Ranger requests me to announce that he will be here until the opening of the session in the morning, and after the close, to attend to signing certificates, etc.

I want to announce also that Mr. Bierstadt, of whom Mr. Clark spoke in his paper yesterday upon color photography, has an exhibit here which can be seen in the Eagle Dry Plate Exhibit. I want to say further, that the bell will be rung at the time of assembling of the sessions; and I hope when you hear that bell that you will all be prompt.

It will be necessary for the exhibitors for all classes to name their judges. I recommend that you meet at the place where your exhibits are, immediately after the close of this session.

Mr. GENTILE—There is a desire expressed by the dealers and manufacturers that their department should be thrown open to the public.

It ought to be open at all times, instead of only one evening. I make a motion to that effect, that the dealers' department be thrown open to the public that are interested in photography.

(Seconded.)

Mr. DECKER—There are many outsiders interested in photography. We have heard of amateur photographers, and they would like to see these exhibits.

Mr. CRAMER—Is the dealers' exhibit closed now during the session—shall it be open to the public during the session? We could not admit the public and keep out photographers.

President—The dealers' department shall be open without waiting until public day.

(Carried.)

Mr. GENTILE—There are two or three gentlemen that unfortunately did not make their applications in time to compete for the prizes, especially one gentleman from a foreign country—from Canada. They are very anxious to enter into competition; if against the rule, it can be rescinded, so that they may be allowed to compete. It would require a vote of the Association to allow that, because of the rule established, and unless the Association agrees to it I do not see how it can be done.

Mr. HASTINGS—Yesterday morning, after time, when the pictures ought to have been in place, application was made to me for competition, which I could not grant, by the party whom Mr. Gentile speaks about. I do not think it is just to those who try to live up to the rules to break them. It seems singular that, though people know a prize is to be awarded, they do not remember that pictures must be hung at such a time, etc. I have no objection to their exhibiting, but I can do no more than the Executive Committee authorizes me to do.

President—It has been our attempt to establish precedents for future Conventions, for which the entries should be made promptly, and we have made the time close enough, so that all could do it in time.

I have an announcement to make, and that is, there is on exhibition at Anthonys' stand specimens of colored work on Dr. Vogel's eoside of silver plates.

I would call the attention of the exhibitors to the fact that they must attend to the selection of their judges.

Mr. HASTINGS—I will state for the benefit of all the judges, after you make your selection, or election and selection, of three judges of each class, the blanks with the names of the competitors are all ready to deliver to that committee in each class.

Moved and seconded that the Association adjourn.

President—This Convention stands adjourned until 2 P.M. this afternoon.

LANTERN SLIDES.—M. Lirondelle, of the Photographic Society of the North of France, gives the following process for making on gelatino-bromide plates positives for the lantern: A contact exposure is made; the light used is from a piece of ribbon of magnesium 3 centimeters in length by 2 millimeters in width ($1\frac{1}{4}$ inch by $\frac{1}{12}$ of an inch), and the pressure-frame is placed 40 centimeters (16 inches) from the luminous focus. To develop, plunge in a bath formed of two-thirds of neutral oxalate of potash at 30 per cent., and one-third of bromide of potassium at 12 per cent. At the end of a few moments pour, drop by drop, while agitating the bath, a very small quantity of a solution of protosulphate of iron, and wait a few minutes for the coming of the image. Use no more of this last solution unless the image is too slow in making its appearance, and allow the development to go on. If the image is too weak, increase the quantity of iron, but only at the end, and when it is found to be indispensable in obtaining the desired intensity. Fix, and afterwards wash. By this process the positives are clear and remarkably brilliant. —*L'Amateur Photographe*.

LETTERING PRINTS.—M. Stravos Zellis, of Alexandria, recommends the following process for marking or lettering on the sensitized paper such names as we wish to give the prints. He takes a piece of thin white paper, and traces upon it the words which he wishes to have at the bottom of his negative, and oils it on both sides. Having removed the excess of oil by rubbing it between two sheets of bibulous paper, he coats it with varnish on both sides, and allows it to dry. On the other hand, he removes from the bottom of the negative a portion of the gelatine equal to the size of the paper, and substitutes for it the paper, which

he sticks by means of a solution of gum arabic and water. He removes then the air-bubbles, which would prevent complete adherence, and this being done, waits for his work to dry. If, when printing on the sensitized paper, it is found that the letters do not show very white, the defective portions should be retouched on the back of the oiled paper. To write his name, M. Zellis makes use of a mixture of gum arabic, lampblack, and water. This process is simple, cheap, and gives excellent results. —*Annals Photographique*.

YELLOW STAINS.—Every photographer is, no doubt, to his own sorrow, familiar with a yellow stain in the negative, caused by taking the plate from the fixing bath before it is thoroughly fixed. Mr. Belitski, the well-known photo-chemist, made some experiments recently to remove this stain, and succeeded very well. A slight stain can often be removed by placing the negative in the following solution: 50 parts alum, 1,000 parts water, 10 parts bichromate of potassium, 20 parts muriatic acid. After several minutes the negative turns yellow all through. It is washed now very thoroughly, exposed to sunlight for several minutes, and developed or blackened with the ordinary iron developer. When the stain is very intense this remedy will not prove to be of any avail, and only by leaving it for twenty-four hours in the Lainer acid fixing bath (so often described in all journals recently) did he succeed in removing the stain, and saving valuable negatives. —*Deutsche Photographen Zeitung*.

OWING to the pressure of the Association reports, "What Our Friends Would Like to Know" is crowded out of this issue.

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ORIGINAL NEGATIVE
BY
F. W. GUERIN, ST. LOUIS, MO.

PRINTED ON
N. P. A. EXTRA BRILLIANT PENSÉ
ALBUMEN PAPER.

STUDY IN POSING.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

SEPTEMBER 13, 1890.

Vol. XXI.—No. 17.

THE VALUE OF ACID SULPHITE.

SINCE the introduction of acid sulphite of sodium as an article of commerce we have frequently been asked what is the relative value of it compared with the regular crystallized neutral sulphite hitherto used? As this is a very reasonable question, and one that is of especial importance in connection with the making up of developers from the formulas given by the dry plate makers, we have taken the trouble to make some experiments in this direction, and thus give our readers some definite information on the subject.

Taking a good sample of the acid sulphite as it comes to us in commerce, one of the best that we could obtain, as supplied by our publishers, we found that 100 cubic centimeters of the acid sulphite solution requires 27 grams of dry sodium carbonate to neutralize the excess of sulphurous acid in it, and have it just alkaline to test paper. To put this into the ordinary weights and measures used by the photographer, 1 fluid ounce of the acid sulphite solution will require 123 grains of dry sodium carbonate to make it just alkaline.

As we have stated on a former occasion, the acid sulphite of soda is twice as strong in sulphurous acid as the neutral sulphite crystals. To put this a little more definitely, 1 fluid ounce of the acid sulphite is equal to 2 ounces by weight of the ordinary sulphite; but in using the acid sulphite more alkali will be required to secure the same quality of developer. This additional alkali must be added in the proportion given above.

If we use crystallized sodium carbonate (soda crystals), the proportion must be increased two and two-thirds times, and the figures become 332 grains of soda crystals to neutralize 1 fluid ounce of acid sulphite solution.

Since the acid sulphite is twice as strong (practically) as the neutral sulphite generally used, it is only necessary to divide the figures given in any of the ordinary formulas by two, use this amount of sulphite and add sodium carbonate slowly until the fluid is just alkaline, to obtain the same proportion as that given for the ordinary sulphite. The great advantage of this method of procedure is that you can regulate the proportion of alkali in the developer much more carefully than when you use ordinary sulphite of sodium; this latter material containing variable quantities of sodium carbonate in excess, according to the care with which it is made. But in our own practice we find it much better to mix the acid sulphite with the eikonogen or pyrogallol at once, and use it as a preservative alone, not attempting to neutralize it until needed for developing.

In this way we have preserved solutions of eikonogen and pyrogallol for months, and in a condition which we have never seen equaled by any other method of procedure. When about to develop we add a little more of the alkali than is usually applied and in the proportion given above.

In order to give some guide to those who prefer to use potassium carbonate as a developing agent, instead of sodium carbonate, the proportions become as follows :

One hundred cubic centimeters of the acid sulphate require 35 grams of dry potassium carbonate to make it just alkaline. In English measures this becomes 1 fluid ounce of acid sulphite requires 160 grains of dry potassium carbonate to neutralize it. Of course, in using potassium carbonate with the acid sulphite of sodium, the resulting mixture contains both sodium and potassium sulphites, and since potassium sulphite is not as soluble in water as sodium sulphite, the potassium carbonate should not be added to the acid sulphite in the concentrated form, but only after diluting, as in the developer. If carbonate of potassium is added to the acid sulphite direct, after a while potassium sulphite will separate as a white powder, that is difficult to get into solution again without heating the mixture. The best way to manage is to add the acid sulphite to the eikonogen or pyrogallol, as stated above, and use the extra potassium carbonate in the alkaline part of the developer.

The use of acid sulphite in the hypo bath is now a well-established practice and we need not say anything here about it. With us stained negatives are a thing of the past, and we heartily recommend this new material to all who wish to obtain clean work in photography.

EDITORIAL NOTES.

WE learn from our exchanges that Messrs. Louis & Auguste Lumiere, of Lyons, have discovered that chloride of barium possesses the quality of dissolving gelatine. The announcement of this discovery has called forth from Mr. Brady a statement to the effect that chlorides of magnesium and of zinc also possess the same property.

It is often required to obtain a good gray tone for bromide prints, and M. Senior, in the *Photographische Mittheilungen*, recommends for this purpose that the bromide be altered to chloride by the employment of a solution of chlorine (chlorine water), which should be followed by redevelopment of the print. This redevelopment should be with either pyro or oxalate restrained with a goodly amount of bromide. If a red tone is desired it may be obtained by the addition of potassium bromide in the proportion of 4 parts to 100 parts of the developer.

It may be of interest to our readers to learn that the fourth annual exhibition of the Photographic Society of India is to be held in Calcutta during December of this year. All communications regarding the exhibition should be addressed to the Exhibition Committee, Photographic Society of India, Asiatic Society's Building, Calcutta.

As earnest and well-directed effort is being made toward forming a National Association of Amateur Photographers, and steps are being made in the direction of a convention of amateur photographers of America, "in order to diffuse

a more widely spread scientific interest in the science of photography and to promote social intercourse among the amateur photographers." The Syracuse Camera Club are taking the lead in the movement, and have issued to every club in the country, so far as they could be located, a circular letter asking their consideration of the subject, and requesting the appointment of delegates to make the preliminary arrangements. We believe the idea a good one, and predict that the accomplishment of it will bring vast good to many of those who have devoted their spare moments to this most fascinating science.

WE note with pleasure that the photographers of the West do not believe in all work and no play, and, acting on the belief that such an order of things makes Jack a dull boy, they have formed themselves into a photographers' association in Toledo, Ohio, and annually go on a regular good time. Their yearly frolic came off at Presque Isle, about a month ago, and was a most enjoyable affair. Would it not be a good thing for some of their Eastern brothers to sink, if only temporarily, personal and business jealousies, and join in an annual dinner, or what-not, on a local basis, where affairs of strictly local interest would be ventilated and discussed?

By some experiments recently made of a most interesting subject, it has been calculated that the duration of an electric spark is only the 10,000th part of a second. The plate for the exposure of the spark was mounted on a disk which revolved at a speed of 2,000 revolutions a minute, giving a speed of 600 inches per second at the point where the outer end of the spark was photographed. And strange as it may seem, there was no perceptible difference between the width of the spark taken at this tremendous velocity and another taken of the spark with the plate in a perfectly stationary position.

THE California Camera Club gave a most enjoyable lantern exhibition on the 13th ultimo, on the "Fair City" of the West, Chicago. The slides exhibited were prepared by Chicago talent, and were shown as one of the regular list of exchanges in the circuit of camera clubs of the West. The slides were of great interest and of excellent quality, and proved the value to be obtained from such exhibitions, which are capable of making scenes in different cities familiar to residents of other cities and towns which would otherwise be entirely unknown to them. The California Camera Club is one of the energetic clubs of the list, and have already laid out a fine programme for the winter.

A SCHOOL of photography, which forms a part of the system of education at the Chautauqua Institute, under the able leadership of Prof. Charles Ehrmann, is doing good and efficient work in making the students familiar with the principles underlying the art, and its scope of labor is so extended that its benefits must be widespread. We doubt not that its good work is growing larger and better each year with such a man at its head.

WE read in one of our exchanges of the venturesome feat of one of the engineers of the steamship *Belgic*, which lately arrived from Chinese ports; who, hearing that execution of a criminal was to take place by the form of punishment known as the Ling Chi, or the thousand cuts, made his way to the scene of the execution, and at the critical moment succeeded in pushing his way to the front, with camera ready, and photographing the victim at the moment of

death, when his head was finally severed from his body, after the lesser members had first been cut off one by one. The details of the scene were brutal in the extreme, and the photographer had difficulty in getting away with his life after having accomplished his purpose. The authorities, too, used urgent measures to suppress the publication of prints from his negative, but without avail.

THE members of the Camera Club of Newark, N. J., enjoyed their annual canal excursion last month, starting on the 18th, going by rail to Dover, N. J., and from there to Easton by canal.

THE regular meeting of the Pacific Coast Amateur Photographic Association was held in 'Frisco on the 7th of August, and was largely attended. A most interesting and instructive paper was read on the construction and use of lanterns, and a field day was chosen for a later date this fall. It is evident, from the increased life among the amateur clubs all over the country, that photography "has come to stay."

MR. JOHN WATSON, of the Kendall Natural History Society, recently succeeded, after much patient effort, in securing four negatives of a woodcock sitting on its eggs in its nest, in the neighborhood of Arnside, a small village on the shore of Morecambe Bay. After having secured these negatives the bird was driven off and negatives secured of the nest and eggs. It is seldom, indeed, that one succeeds in photographing any bird on its nest, and particularly of a woodcock, and we think that Mr. Watson is to be congratulated on his achievement.

THE New Orleans Camera Club is in a flourishing condition, which is largely due to the untiring efforts of Mr. P. E. Carriere, of that city, who has been largely instrumental in bringing it up from its infancy to a prominent position among the clubs of the country. The Club is composed entirely of men, and as it seems to be desirable that some such organization be opened to ladies, it is proposed to form a junior camera club, which shall include them in its list of eligible members. We hope this projected enterprise will succeed, and if it does we feel sure that the junior club will.

ONE of the novelties in the line of camera boxes which was shown at the recent convention in Washington, and which attracted much favorable notice, was the Magazine Camera, made by the firm of our publishers. This camera admits of almost an endless number of either plates or films being carried, and by its peculiar construction they may be changed in the open field without the use of changing bag or any such contrivance. It has already created a wide-awake interest, and we feel certain it will be better known shortly. We have used it this summer and think it a very decided advance in hand cameras.

WE quote from one of our English exchanges an admirable method of painting backgrounds. The frame of suitable size, say 6 feet by 9 feet, firmly made and braced at the corners, should be carefully covered with unbleached cotton, and a size made of a solution of starch, 4 ounces, to water, 12 ounces, is applied; then proceed to brush over the surface, with a broad flat brush, the color, which should be composed of

Common whiting.....	15 ounces.	Molasses.....	8 ounces.
Powdered glue.....	5 "	Water.....	¼ gallon.

To which, when thoroughly mixed, should be added

Ivory black.....	1 1/4 ounce.
Ultramarine.....	3/4 "
Red ochre powder.....	3/4 "

and, after being thoroughly heated over the fire, will be found to give good satisfaction.

A VERY delightful outing and dinner was enjoyed by the Photographic Section of the American Institute at Glen Island, on September 4th, details of which will appear in our next issue.

Mr. H. E. HOLMES, of Seattle, Wash., sends us a couple of 5 x 8 views of the Olympian Mountains, taken on Vogel's eoside of silver plates. They are remarkable specimens of photography, the snow-capped summits of the mountains standing out finely at a distance of seventy miles from the point of view. We are satisfied that these plates are destined to be used more and more for fine landscape work.

[From our *Special Correspondent*.]

ENGLISH NOTES.

THE tone of the print upon ordinary sensitized paper is in the main determined when the cap is taken off the lens; for "as is the negative so is the print." A good plucky negative never fails to give rich easily toned prints. But something may be done by long printing in a weak light, and the use of a lime toning bath, to get those purplish-black hues in which the soul of the average photographer delighteth. We once obtained a fair silver print from an extremely thin negative by suspending the printing frame (inverted) by strings, so that the face of the negative was about 6 inches from the floor of an ordinary room. In this situation the print required two long summer days to assume the necessary depth of tone; but it was—for the negative—wonderfully good. The precaution was taken to "back up" the print by a piece of old sensitized paper; this exerts a preservative influence on the print, and is very useful in winter, when negatives take perhaps several days to print, and when the paper is very liable to discolor and turn yellow.

Experiments which I have lately been making show that something may be done to influence the tone of the print by printing under colored glass. Green glass laid on top of the printing-frame certainly causes the tints of the print to be blacker; and this experiment is well worth trying by those who favor dark prints. The probability is that the molecules of silver aggregate themselves in different ways according as they are quickly or slowly affected by light, and also according to the color of that light; then, in toning, the molecules of gold which replace the molecules of silver are, of course, similarly varied in their arrangement. The result is that it is possible by such variations in treatment to produce—within certain limits—variations in the colors of our silver prints, from a rich brown to a deep black.

Now will some of the readers of the BULLETIN give this plan of printing through green glass a trial? Print deeply, and try the following toning-bath:

Gold chloride.....	2 grains.
Uranium nitrate.....	2 "
Borax	1 dram.
Distilled water.....	12 ounces.

While a noble monument to Daguerre is being raised by the photographers of the United States, a correspondent in Paris writes me that the tomb of the great artist at the village of Cormeilles, near Paris, is in a much neglected state. The church at this village contains a fine dioramic painting by the old scene painter, which is fixed behind the altar, and which doubles the apparent length of the edifice ; and this, too, is said to need reparation. Doubtless our French brethren will see that these memorials of the founder of their art are put into a creditable condition.

Norway has become quite the "happy hunting-ground" of the British photographer. One party from Birmingham which has just returned included eight photographers, who made altogether 2,000 exposures. But these are surpassed by a party of three from the same neighborhood, one of whom made 620 exposures with his own kodak ; the others about as many between them.

The Photographic Convention, held at Chester during the last week of June, proved a failure. The attendance was extremely scanty and the proceedings devoid of interest. The fact is, that we have now three bodies in this country competing for the lead in matters photographic. First comes the Photographic Society of Great Britain, which dates back to 1853. This society has missed golden opportunities during the last few years. Had it obtained a royal charter of incorporation, and secured a commodious club-house as headquarters in London, it would have reigned *facile princeps* over the photographic world ; but it has remained in a semi-fossilized condition, and probably will undergo no alteration as long as the present President, Mr. James Glaisher, a fine old scientist of fourscore, continues at its head. Still the exhibition which this, the "parent society," holds annually in Pall Mall, in the month of September, has always been the chief exhibition of photographs of each year since the society began.

Next comes the Camera Club, which has assumed—thanks mainly to its able Secretary, Mr. George Davison—the first position as a social meeting place for the best class of workers. It dates only from 1885 ; and its importance will be still further increased when the new premises, which are being built specially for the club in Charing Cross Road, are completed. The Camera Club holds a conference annually in London in the month of March.

In the third place we have the "convention" (modeled on the plan of the American institution of the same name), which held its first meeting in 1886. Such is the enthusiasm in photographic circles that this migratory body—whose meetings have been held at Derby, Glasgow, Birmingham, London and Chester—would certainly have been a success if the management had been fairly good. As it is, the average attendance has been only a little over one hundred at each meeting ; a fact which, when we consider the two hundred photographic societies and the tens of thousands of workers in photography in the British Isles, is alone sufficient to stamp it as a dismal failure.

What we hope for in the future is the amalgamation of the P. S. G. B. and the C. C. (the "convention" will probably soon cease to exist). Photographers will then be represented by a powerful and united body, well able to sustain their claims and to defend their interests.

I notice that American photographers seem to make but little use of "cycles" as an aid for the carriage of themselves and their apparatus. Is this because the roads of the States are in too poor a condition to admit of the ready use of the

two or three wheelers? If so, I may say that an Irishman has recently invented a pneumatic tire, consisting of a large tube of India-rubber distended with air, which encircles each wheel, and the effect of which (on bad roads especially) is really wonderful. It is, in fact, "riding on air." With an ordinary tricycle I have recently proved that I can more easily convey a whole-plate set of apparatus, and, at double the speed, than I could a quarter-plate set without it.

Harking back to that good old theme, the weather, I may say that up to the present date (early part of August) we have had a continuance of dull, leaden skies, with much rain—a most unfavorable season for the knights of the camera, in fact. Yet the demand for apparatus was never brisker. The London Stereoscopic Company have just completed their handsome new premises at 110 Regent street, London. They cater especially for American visitors, and their show-rooms, studios, dark-rooms, etc., should be seen by every visitor to England. They carry a very large stock of apparatus and material, and their manager—Mr. Butler-Humphreys—is as courteous as he is able. The name of this company, the "Stereoscopic," dates back some thirty years, to the time of the company's formation, when dual photography was all the rage. Efforts have been, and still are being made, to revive the stereoscope. In its best form it is a charming instrument, but the production of stereoscopic pictures is too much trouble for the average "hammytoor," at least that is the opinion of

TALBOT ARCHER.

THE EXHIBIT OF PHOTOGRAPHS AT THE WASHINGTON CONVENTION.

It may be remarked that while the number of exhibits was perhaps on an average with those of preceding years, there were no collections so large as several that were sent to the Boston Convention. There was a notable falling off in competitors for the grand prize, which seems hard to explain, as the poem of Enoch Arden offered great opportunities for illustration, and the bronze group that was to be carried off was most tempting, aside from the honor which it would signalize.

It was to be regretted that the pictures could not be hung in a better light, but the fine space and light we had at Boston last year are seldom to be had.

The work in the genre class was exceedingly good, and of a uniform excellence that made a hard task for the judges. In this class F. Guerin, of St. Louis, had a most interesting and valuable display. It consisted of six large pictures, in which the technical merit and the story they told left little to be desired. If one were to particularize it may be said that "A Young Tar," "Laughing Eyes" and "Cupid After Wings" possessed a shade more of interest than the others. The salt sea air and rugged grace which invested the young sailor gave a value to this piece that it is hard to set down in words. Mr. Guerin was very fortunate in his model for "Laughing Eyes;" the unconsciousness and beauty of the subject and the fine handling made the picture most interesting and vital. "Cupid After Wings" was most unique in conception and happy in composition—a droll and admirable illustration.

The interest and profit of these convention displays is greatly enhanced by such work as his.

Motes, of Atlanta, Ga., also exhibited six large pictures of great excellence. The work of this exhibitor is always of a high order. Three were illustrations

of "Miles Standish's Courtship." Mr. Motes is strong in history and composition at all times, and this series well supported his reputation. A group of statuary in this collection was of too high an order to miss special mention. But perhaps the most charming thing in this collection was the figure of a little girl illustrating the lines:

"There she sat knitting and rocking,
Always knitting on grandpa's stocking."

The quaint little child-woman and the skillful treatment by the artist combine to make this one of Mr. Motes' happiest efforts.

A group of darkey lads in the act of stealing fruit was a picture that must have presented great difficulties in successful handling, but resulted in a very interesting picture.

McMichael, of Buffalo, N. Y., has of late years exhibited very important work. In his collection in this class there were two pictures upon which he may well rest his reputation. Reference is had first to Enoch Arden in his last moments, when he rises in bed to a sitting posture and, with outstretched arms, cries out: "A sail! a sail!" Everything necessary to a successful picture seems to be present here. The model for Arden was an ideal one for the work in hand, the composition excellent, and the technique of the highest order. The result was that the sentiment of the scene received an interpretation most rare and impressive. It seemed to us a pity that this illustration did not form one of the three which he entered for the grand prize.

The other picture was entitled "A Game of 66." Here, again, he was happy in his models. Six is an uncommon number to secure to one's mind, and it was an uncommon piece of grouping as well. As a photograph there was no ground for criticism, and as a picture it stands forth a work of art. It is work of this sort that contributes to the elevation of photography and photographer. The other four pieces of this exhibit were examples of good photography, but had no special merit as illustrative pictures.

Stein, of Milwaukee, had a collection of pictures that took the medal in this class. They were six in number, and characterized by that uncommon excellence which usually distinguishes his work. Here there were three pictures that appealed especially to the observer. "The Miser" was a piece of great merit. The figure is represented in an attitude of alarm, with disheveled hair, and holding a candle extended in one hand, exclaiming, "Who comes there?"

This picture received some criticism as a photograph, but when one reflects that the whole scene is supposed to be illumined by the light of a candle, it will be seen that a treatment as by daylight, with soft, transparent shadows and modulated lights, would have been absurd. Mr. Stein is too much of an artist to make such a mistake. It was a robust picture, and full of vital force.

"A Man's a Man for a' That" represents a blacksmith at his forge. Good composition, fine technique and great charm in illustration are the points that marked this piece. The third to which allusion is made was the "Beggar Girl," which may be set down as the best of the exhibit. The treatment was most charming in its simplicity and the sentiment most fine and touching. The young girl, in her poverty-stricken habiliments, stands with half-extended hand murmuring "Please, sir!" A photographer is always greatly indebted to or dependent upon his model, and it would seem in this case she must have been a very clever actress. But no less clever is the photographer who can make a picture

of this character with whatever assistance. There was a unity of effect and an atmosphere and an all-pervading sentiment that placed this illustration by the side of the best ideal work of the painter.

Rosch, of St. Louis, was a competitor in this class. The refinement and imagination that always characterize his work were seen here. Three of the number were of the shadow variety, which called out so much comment on his exhibit last year. While this sort of work can scarcely be defended on art principles, since the figures are not illumined by a light that would throw such shadows on the wall, it is very unique and pleasing. One group, "Little Bob's Fish Story," was most exceedingly clever in its composition and full of spirit and go. It was a capital story capitably told. Apart from the shadow pictures there was one of especial merit, an illustration of Annie Arden with a seaman's glass, by the coast, trying to catch sight of the ship upon which is Enoch. Although this was but a single picture, one could not but regret that there were not two more, when it might have been entered for the grand prize. It was a piece of sentiment rarely met with in a photograph.

Randall, of Ann Arbor, Mich., had six pictures in this class. There were two of great value.

"Crumbs of Comfort" represented an old lady poring over the Scriptures by the light of a candle. The interior of the humble abode, the choice of the model, the harmony of accessory effects, all contributed to the production of a very telling picture. There were few pictures in the exhibition in which the interest was so strongly centralized.

The other, "Joy to the World," was a child choir managed most cleverly and artistically. These two pictures are enough to give Mr. Randall rank as an artist in photography. This young exhibitor is rapidly coming to the fore.

Hardy, of Boston, Mass., should have entered his exhibit in this class, we think. It was a series of twelve photographs illustrating mythological subjects. This was a capital collection of pictures, and illustrated again how important are good models. Great pains and artistic skill were evident in the work as well. "Galatea," "Cupid" and "Psyche," and "Venus," may be particularized as exceedingly effective.

For the grand prize—Enoch Arden illustrations—there were but six competitors.

McMichael, of Buffalo, N. Y., had three pictures of very high technical excellence, but they did not hold their own very steadily under the Association rules for judging this class. "Enoch on the Island" was by far the better of the three. Here he was represented not as scanning the sea for a sail, but overwhelmed and prayerful, at a point of time closely following the death of his two companions, illustrating the lines:

"In those two deaths he read God's warning—wait."

This was a picture of remarkable strength and import.

The other two illustrations seemed too near each other in point of time, and historically and artistically weak.

Stein, Milwaukee, Wis., had one picture that came near being great. The rock on which he split was in attempting what is impossible by means of photography. Reference is had to the scene where Enoch looks in at the window, and beholds his family, with Philip, around the fireside.

The figure of Enoch is lighted by the moon's rays, while the moon is hid behind the trees in the garden. It was very cleverly managed, but fell short of satisfying. The earlier scene, where Enoch and Annie are love-making in the wood, seemed to fail wholly in giving the sentiment. The third—"Enoch Watching for a Sail"—was of that hackneyed character which the stage has given us. Here he is shown clad in fur, which is hardly in accord with a tropical clime. Mr. Stein was not at his best (which is very good indeed) in these pictures.

George H. Hastings, of Boston, had one picture which deserved all praise—"Annie over the Empty Cradle"—and another, "The Quarrel Scene," which was well composed and good in many ways, though not specially strong. The third did not add greatly to the merit of the exhibit. These pictures were 11 x 14 in size. He was awarded the grand prize.

Miss Catherine Weed Barnes, Albany, N. Y., so well known in amateur circles and editorially, had three pictures of the same size. Miss Barnes seized the vital points in the poem firmly, but was evidently able but to make her illustrations come up to her conception in but a single instance. She had one piece that was vital in all respects, and it may be said that the other two were fairly good. When more practice comes to the aid of this lady's fine intelligence and feeling it may be predicted she will give us illustrative work of great value.

Eaton, Potsdam, N. Y., was evidently imbued with the spirit of the poem, but fails in composition. His quarrel scene of the children was very fine in sentiment, but lacked concentration and massing. Mr. Eaton would probably improve the two others greatly a year or two hence.

Baker, Columbus, Ohio, had a series of beautiful illustrations. Technically, artistically and illustratively, they reached a high mark. The first picture gave us the sailor lad in the little port, with that robustness and spirit with which the poet has clothed him, with accessory suggestions of the life he led. Again, on the lonely island, gazing out to sea—a scene full of the desolation of those long, weary years. In the third he appears again mending nets in the old seaport, a bowed, broken and patient man, waiting for the end. In the latter, one might wish that the strong light which relieved the gray head could have had its direction accounted for by some trifling illumination of the corner of the somber background into which the figure almost sank. But these pictures were so nicely balanced in interest, so well composed, and so effective, that they invite but little criticism.

In Class B, Large Portrait Work, Dana, of New York, was awarded the gold medal. The pictures that won it composed one of the largest collections in the exhibition, and their excellence was acknowledged by all. It was the charming style of camera portraiture that comes from the hands of an artist—full of taste, refinement and feeling. These pictures were fine examples of management of white drapery and picturesque posing. The only criticism that would suggest itself here was that of over-retouching.

Iandy, Cincinnati, Ohio—silver medalist in this class—showed nine pieces. There were two heads of men in this exhibit that may be particularized for their magnificent portrait effects. One lost something by cutting away the shoulders too much, however. A half-length figure in uniform was exceedingly fine in action and showed the most skillful handling. The retouching of these pictures was most commendable; no niggling work, but free, bold treatment, with the modeling perfectly kept.

O. P. Scott, Chicago, Ill., took bronze medal. His exhibit consisted of six large heads. The best by far was that of a young lady against a white ground. Mr. Scott's negatives are evidently better than the prints made from them, which are of a muddy character, like what are frequently made in damp weather.

Dames, Oakland, Cal., showed a splendid line of work. These pieces were largely female figures against white grounds. There was a delicacy of treatment and an artistic feeling that made this collection one of the finest in the whole exhibition.

Baker, Columbus, Ohio, had six large pictures of remarkable value. Being a contestant for the grand prize, the rules of the Association did not permit him to compete in another class. The beauty and feeling that pervaded this work must be seen to be appreciated. "Beatrice Cenci" was one subject, illustrating Shelley's lines :

"Cut off from the only world I know,
From light and life and love, in youth's sweet prime."

The light-clad figure found full relief against an impenetrable dark ground, a single dim window furnishing the apparent light. The air of the figure and expression of the face told the pathetic story most touchingly. Another, a shadow effect of a full-length female figure draped in white, against a white ground, with the face illumined with wonderful transparent shadows, had a charm of artistic effect that is most baffling to description.

Each piece might be mentioned as examples of photographic excellence rarely attained.

Bowersox, Dayton, Ohio.—An exhibit of six heads—very fine, photographically and artistically considered. One piece may be mentioned in particular—a half-length figure of a young female in white, on dark ground. The pose was exceedingly happy; the hands held in the most unconscious way, and altogether it was as charming as possible. Mr. Bowersox is a rising man.

Geo. H. Van Norman, Waltham, Mass., had a display of various sizes, including a number of examples of twin or double pictures, very cleverly done. The work of this exhibitor was brilliant and praiseworthy, showing careful training and conscientious endeavor.

Stimson, Appleton, Wis.—This exhibit consisted of a large plush frame, with a maroon felt ground, carrying a large number of panels, 8 x 10 and larger. A very meritorious display. Awarded silver medal.

J. Inglis, Chicago, Ill.—Eight large pictures were shown on aristo paper. The tones were very dark and rich. The artistic value of this exhibit was very great. Particularly noticeable was a little child in white dress, and young lady, seated, holding her with both hands. Other children in hats were exceedingly picturesque.

C. W. Motes, Atlanta, Ga.—Six examples of fine work. Standing female figures in white draperies were most charmingly handled—two heads with nice portrait effects. The gem of the collection was a seated half-length female figure in Greek costume. This was a piece of great value.

McCrary & Branson had nine large photos. Two heads of young ladies, framed in metallic circles, were beautiful and artistic pictures. The other work was good.

A. H. Plecker, Lynchburg, Va., showed six large photographs: one male bust figure of great merit.

Hall, Buffalo, N. Y.—Six pieces of large work. These pictures showed a tendency to violent contrast in light and shadow, but were examples of brilliant chemical effect. More attention to posing would improve Mr. Hall's work.

Monroe, Jamestown, N. Y.—An interesting exhibit on aristotype paper. This collection included a number of very fine subjects splendidly handled. The interiors in this collection were overloaded with background and accessory effects, breaking up the unity and detracting from the interest of the subject.

B. La Marsh, Kenosha, Wis.—Large display of work, containing some good examples of photography. This exhibitor injures his work by retouching till a metallic surface is produced; also by the use of too dark backgrounds for vignettes in many cases. Some cabinets were very fine, particularly a group of two young ladies in animated conversation.

Rothengatter, Philadelphia, Pa.—An exhibit showing good examples of chemical work; posing not always the best. Some stage pictures by flash light were fairly good; also examples of glacé work.

W. Stuber & Brother, Louisville, Ky.—Case of very fine small work, showing great refinement. Excellent posing and lighting; artistic in all respects. Awarded a gold medal.

E. T. Billings, Racine, Wis.—Some good work of small size. This work was characterized by great clearness and brilliancy. One group, about boudoir size, of five persons, was most happy in grouping and action.

Fowler, Charlotte, Mich.—A case of brilliant photographs, in the sense of chemical effect and shine. Posing and lighting should receive more attention. Some larger sizes were greatly better, soft and nice in effect.

Jac Maul, Chicago, Ill.—Frame of cabinets of great excellence. This artist deals in pronounced effects.

M. Kets Kemethy, Washington, D. C.—A frame of assorted sizes of the usual run of every-day work.

Theo. Heinig, Dayton, Ohio.—Twelve cabinet-size photos, mounted on mounts with wide margin and lithograph center. This work was of most unusual excellence, artistic, refined, and charming in every sense; perhaps the best exhibit of cabinets in the hall. Was awarded a bronze medal.

Eddy Bros., London, Can.—A miscellaneous collection of portraits of very good value. Some large heads in this exhibit were finely modeled; also some landscape work, particularly interesting.

Albert L. Breton, Washington, D. C.—A display on both soft and albumen paper. Some nice handling.

E. W. Lincoln, Cambridgeport, Mass.—Fifteen 8 x 10 interiors, of great and uniform excellence. Silver medal.

Miss C. E. Sears, Boston, Mass.—A collection of small landscape views, charming in all respects. Silver medal.

J. Zybach, Niagara Falls, Ont.—Fine photos of Niagara, of heroic size, which for pictorial value and technique have probably not been excelled. One most happy feature was that the cloud effects were caught in the same negative, and not printed in. Was awarded a bronze medal.

Adam Heimberger & Sons, New Albany, Ind.—Very fine collection of views. These views were of a character to stamp the photographer an artist. The technical value, composition, and light and shade all contributed to make these pictures gems. Gold medal.

Allen & Rowell Co., Boston, Mass.—A superb collection of marine views. These pictures were not simply photographs, but pictures of great artistic value. A number were in carbon, which is a specialty with this house. These views were a feature of the exhibition.

Columbus, Ohio, Enameling Co.—An exhibit of a lot of fine cabinets with glacé finish.

Astronomical Observatory of Harvard College.—Some interesting astronomical work.

Narso Dewjee, Peopal, India.—A series of groups of natives ; interesting as showing the national characteristics and the status of photography in that distant land.

Hanna, Auckland, New Zealand.—This was a collection of photographs brilliant in technique. These pictures were all of glacé finish. Bronze medal.

Lafayette, Dublin, Ireland.—This was a magnificent display of work on panels of enormous size. These pictures were greatly elaborated, and of much artistic value. Some of the posing was, doubtless, beyond anything ever seen at our conventions. A part of the work was on platinum, and was far more pleasing than the albumen prints from our individual standpoint. Gold medal.

Gottheil & Sohn, Germany.—A moderately fine exhibit of small miscellaneous work, partly on platinum. Silver medal.

TYPES OF BEAUTY.

[Before the Washington Convention.]

BY PROFESSOR THOMAS WILSON.

MR. PRESIDENT : It would be eminently proper for some scientist before some such congress to show what photography has done for science, to show what assistance and aid it has given. But it would be foreign from my purpose to do so. I am not insensible, however, of the benefits given by photography to science. In astronomy, Professor Langley, the head of our institution, would concede the great indebtedness of his science to photography. Next after original research and discovery is the necessity for a record thereof ; the latter almost equaling the former in importance. Photography makes the record and is entitled to a fair share of the credit for discovery. The lists of similar credits might be extended to a wonderful length. I leave it to your own knowledge and remembrance without attempting to enumerate. It has been of great benefit and use in the study of the races of men, and as a proof thereof, I do but call to your remembrance, as I show the great album of Prince Roland Bonaparte containing the photographs, two of each specimen—a full face and a profile view of each subject—in the various countries which he visited from Lapland in the northeast to French Guiana in the southwest.

I am not a photographer. I am interested in the science of anthropology, or rather in a small proportion thereof, and I am to speak to-day upon the subjects of types or styles.

Anthropology is the natural history of mankind, and the types of which I am to speak are those of human kind. The attempts at the classification of mankind are numberless. They began early and have continued late. One ingenious scientist made a classification which comprised as many as sixty-two different races of men. We all remember how, in our younger days, the standard classification showed five races : The Caucasian or white, the Mongolian or yellow, the Ethiopian or black, the Malay and the Copper-colored. In the present day the two latter have been dropped, and now the grand divisions consist only of white, yellow and black.

But there have been divers other schemes and systems of classification, and if you please, I will speak for a few moments in giving a description of the various types of mankind as at present classified by different scientists. After that of color just mentioned is that type or race of mankind classified according to the shape of his head. It is called the cephalic index, and, not to use abstruse scientific terms, may be determined by the proportionate length and width of the head—the long, short, and medium heads.

ANTHROPOLOGIC TYPES.

By Cephalic Index :		
Dolicocephalic,		Herman Welcker,
Mesocephalic,		Broca.
Brachycephalic.		Broca.
By Form of Hair :		
Ulotriches (woolly hair) and		Huckel
Lissootriches, or		and
Leiotriches (smooth hair).		Muller.
By Dental Index :		
Microdont,	42.	
Mesodont,	42 and 44.	Professor Flower.
Megadont,	above 44.	
By Unity of Characteristics :		
Leptorrhine,		
Mesorrhine,		Professor Topinard.
Platyrrhine.		

In determining the characteristics of the various types of mankind it becomes necessary to have living specimens, and here it is that photography can aid anthropology. One of the great anthropologists of this century in Paris has been making a collection of the various types of mankind, and he does it by means of photographs. He has discovered, or thinks he has, that the type or origin—the race to which the party originally belonged—is better preserved among women than men, at least that the evidences and characteristics are better preserved among women than among men. So he has made his collection from among women, and to make it more attractive and worthy, he declared it to be his intention to choose only the beautiful women for his types. Therefore, his is a collection of types or standards of beauty, and this is made by a series of photographs.

We have the declaration of the Holy Scriptures that “man is but little lower than the angels.” Man has been conceded to be the highest representative of the animal kingdom. Some of the ancient philosophers considered that man and woman, male and female, would constitute but one being in the future world; that man was the representative of strength and wisdom while woman was the representative of love and beauty. I agree with the ancient philosophers, and I commend the ancient artist. Throughout all time artists have chosen women as their standard types of beauty. Most truly she is, for, judging by our standard and looked at with our eyes, we cannot but declare that whatever else the Creator of the world and the Maker of all things might do, he certainly has not made anything more beautiful, more lovely, more charming, more attractive, more to be worshiped on earth, than a beautiful woman.

But here is the opportunity for the anthropologist to call to the aid of our science the profession of photography, and not now, but at some future time when all the signs are favorable, I propose to appeal to the photographers for selection and contribution for a photographic type of that representative woman whom they consider the most beautiful; that is, to obtain from each one his standard of female beauty. And this collection shall pass into this great museum in which you now hold your meetings, and stand in future years as the standard types of the photographic beauties of the nineteenth century.

TEACHER—Define quartz.

MILKMAN'S SON (absently)—Pint and a half.—*Judge.*

THE NEW METRIC STANDARDS.

BY PROFESSOR T. C. MENDENHALL.

[Before the Washington Convention.]

ALL persons actively engaged in your profession must have a natural interest in the subject of weights and measures. Members of most professions have to do with operations of weighing and measuring—some with measuring more than weighing, and some with weighing more than measuring—but all with both of these processes to a greater or less degree. Methods of weighing and measuring have improved constantly from the earliest times, and have kept pace with the advance of other technical processes. It is, therefore, believed that you will be interested in a few remarks concerning some of the more recent advances in relation to the establishment of decimal standards of length and mass in this country. Before speaking of this, I will refer very briefly to some facts which may not be very generally known regarding our customary system of weights and measures.

Although the yard is universally accepted as the unit of length, and the pound as the unit of mass, it is not generally understood, I believe, just in what respect the yard is the unit of length, or the pound the unit of mass. That is to say, it is not generally known in what degree these units have been legalized by Acts of Congress. Doubtless, many of you are familiar with the facts which I will briefly recapitulate.

The Constitution of the United States authorizes Congress to establish a system of weights, measures and coinage. The establishment of a system of coinage, as you know, was one of the first acts of the government, and the system then adopted is certainly one of the most perfect, if not the most perfect, that the world has yet seen. But, although Congress had the power to establish a system of weights and measures, it has never yet seen fit to exercise this power; that is to say, Congress has never yet passed a law declaring that the yard shall be the standard of length throughout the United States, and that the pound shall be the standard of mass. In what way, then, have these units acquired the recognized legal standing which they unquestionably possess? To this question I will reply, that it has come about almost exclusively through the action of the State governments, as encouraged and assisted by the national government. In the early part of the present century the subject of weights and measures was involved in great confusion throughout the whole country; the States did not agree among themselves, nor were the same units or standards of weight and measure used exclusively in any one State.

It soon became evident, however, on account of the very important and extensive operations of the general government in the survey of its boundary lines and coasts, and also in the collection of duties upon imported goods, that it was important for the government to select or establish a unit of length and a unit of mass, which might be used in these operations, and in others in which the government was engaged. The business of surveying the coasts and of collecting the duties was then, as it has been almost continuously, under the direction of the Secretary of the Treasury. The establishment of a unit of length was virtually intrusted to Mr. Hassler, the first superintendent of the Coast Survey, who selected a certain number of inches—or, rather, certain particular inches—from a scale known as the Troughton scale, which is now in the archives of the Coast and Geodetic Survey. Ten or fifteen years later (about 1828) what is known as the Troy pound, which was brought to this country under the direction of Albert Gallatin during the Presidency of John Quincy Adams, was selected as the unit of mass for purposes of coinage. This was done by definite Act of Congress, and not by the mere direction of a department official, and in this respect this standard of mass takes a higher rank than does the standard of length. This Troy pound was adjusted to agree as closely as possible with the British standard by the celebrated Kater, and was brought to this country sealed, and shortly after its arrival the seals were broken with considerable ceremony by President Adams. This standard is at present, and has been during most of its

life, deposited in the Mint at Philadelphia. It is an imperfect standard in its construction and in its form, and is by no means up to the requirements of modern metrological science. But, in 1836, in order to encourage uniformity in weights and measures throughout the whole country, Congress passed an act providing for the construction by the Bureau of Weights and Measures, which has always been under the direction of the Superintendent of the Coast and Geodetic Survey, of accurate copies of these standards, together with capacity measures of various kinds, which were to be distributed to the various States in the Union. The effect of this distribution has been to insure practical uniformity in weights and measures throughout the country. In the absence of positive legislation by Congress upon the subject, nearly, if not quite, all of the States have enacted laws in which they have adopted the standard yard, or, rather, each its own copy of the Treasury standard, as the standard of length for the State, and a standard of mass, which is also a copy of or derived from the Treasury standard.

From this bit of history, with which, doubtless, many of you are already familiar, you will learn that, while Congress has never really legislated to provide these very important and necessary standards for the use of the whole country, practically the same result has been attained through the adoption by the State Legislatures and general assemblies of the distributed copies of the Treasury originals. It is to be regretted, however, that this leaves us in the condition of having, in this country, a multiplicity of standards—forty or fifty, perhaps—instead of a single standard, which would have been theoretically, if not practically, more desirable. It is an interesting and important fact that the first standards of length and mass, which were really legalized by Act of Congress for the whole country, were the metric standards. In 1866 an act was passed making the use of the metric system permissible in the United States, and establishing legal equivalents among the various units and denominations of that system and the customary system. By Act of Congress it was also provided that each of the institutions of learning, known generally as the land-grant colleges, should be provided with a set of metric standards, including a meter and a kilogram, with the multiples and sub-multiples of the latter, and also with the metric measures of capacity. As Congress had acted upon the matter, no State action was necessary to legalize the use of this system, and I believe that none was had by any of the States. The Bureau of Weights and Measures is in possession of many interesting and accurate copies of the meter of the archives, and from these the standards thus distributed were obtained.

The next important step was taken in the year 1869, when the French Government issued an invitation to various countries to send delegates to an International Commission, to meet in Paris in the summer of 1870. The object of this commission was to consider the question of constructing an international standard meter which should represent with all possible accuracy the actual length of the meter of the archives, and which should be more in accordance with the demands of modern metrology. At the short session which was held in 1870, it was agreed by this commission that a committee should be appointed to make experimental researches, especially with the view of determining the best form for the international prototypes and the best material for their construction. The United States was represented upon this committee, which began its operations early in the year 1872. In the autumn of that year the International Commission met again, and at that meeting twenty-five nations were represented by forty-three delegates. It was there determined that the international meter should have the length of the meter of the archives at zero centigrade, and that it should be composed of an alloy of platinum and iridium, 90 per cent. being platinum and 10 per cent. iridium. It was also agreed that the composition of the kilogram should be the same as that of the meter; that its mass should be derived from the kilogram of the archives in its actual present condition, and that it should be determined with reference to its weight in a vacuum. It was also decided to enlarge the scope of the commission by the establishment of an International Bureau of Weights and Measures,

and this proposition having been submitted to the various governments, a treaty to that effect was signed at Paris in 1875. Previous to this time the experiments of the committee charged with construction had led to the production of what is known as the alloy of 1874, which was cast in a single ingot weighing 250 kilograms.

Although upon analysis this alloy was found to contain such impurities that it was thought best by the International Commission to reject it, yet certain standards or units were prepared from this alloy, and one of these is in the possession of the Office of Weights and Measures in Washington. It was not until about the year 1882 that the difficulty in the way of preparing raw material for the construction of these standards was overcome. The method of preparing this alloy is described as follows: For the kilograms pure platinum and iridium in a finely powdered state were weighed in the proportions sought, and well mixed in quantities of 10 kilograms at a time. Each of these quantities was compressed into a cake and heated to a red heat in a covered platinum crucible. Each cake was then put into a furnace of pure lime and melted with an oxyhydrogen flame and then poured into molds also made of pure lime. After various other processes the ingots were forged under a powerful hammer. After forging the metal was passed between polished steel cylinders and reduced to plates about 2 millimeters thick. Finally all the metal was melted, as before, for a third time, in May, 1884, and cast in a single ingot weighing 65 kilograms.

The metal thus obtained was heated in a specially constructed lime-furnace, then forged under a hammer into a square bar 52 centimeters long by 7 centimeters thick. This, in turn, was heated and rolled between steel cylinders into a cylindrical bar 200 centimeters long and 44 millimeters thick, and at this stage pieces were cut off the ends and analyzed, and found to be pure. This bar was cut into forty cylinders for the standard kilograms.

The metal for the meter bars was prepared in about the same way. After the several meltings the mass was divided into five lots. These having been examined and found to be pure and homogeneous, were each divided into three parts. These were then arranged in groups made up from each of the five lots, melted together and cast into ingots, each of which contained sufficient material for one standard. The bars, after having been forged, were passed between rollers until they assumed approximately the shape desired. This operation required three days sixteen hours each, for each bar; *i.e.*, two bars a week were planed, saving accidents. The bars were then cut to exact length (1.02 meters), their edges were made straight and the neutral surface was made plane. The polishing and tracing was then done at the Conservatoire des Arts et Metiers.

Great care was taken in ascertaining the coefficient of expansion of all of the bars after their preparation, one being selected and studied by the usual method for determining this constant, and the coefficient of the other bars being determined relatively to this one by comparison at various temperatures. Thirty bars were prepared and very carefully compared with each other, and it was found that none of them differed as much as three one-thousandths of a millimeter from the meter of the archives. That one which was closest in agreement, and which was altogether the best for the purpose, was selected by the committee and set aside as the international standard meter, thus taking the place, as a matter of fact, of the meter of the archives. The remaining bars were distributed by lot to the various contributing countries. Forty-two kilograms were constructed. Their densities were determined by the most accurate processes, the weighings being made in a balance especially constructed for this work, which was capable of weighing in vacuo, although the actual weighings were made in air. The actual construction of the balance permitted the transposition of the standards and a manipulation of the weighings without approaching the balance nearer than about 4 meters.

An analysis of the material of which these standards are composed showed that it was almost exactly in accordance with the original plan—that is to say, that it contained 90 per cent. platinum and 10 per cent. iridium. There were traces, however, of rhodium and iron. The two meters which came to the

United States in the allotment were Nos. 21 and 27, and that of the alloy of 1874 is No. 12. Of the kilograms we obtained Nos. 4 and 20. The equation of these standards is given below :

EQUATION OF THE UNITED STATES PROTOTYPES.

Meters.—Micron.

$$\begin{aligned}\text{No. 21} &= 1 + 2.5 + 8.665 T + 0.00100 T^2 \\ \text{.. 27} &= 1 - 1.6 + 8.657 T + 0.00100 T^2\end{aligned}$$

Alloy of 1874.

$$\text{No. 12} = 1 + 3.3 + 8.634 T + 0.00100 T^2$$

Kilograms.

	Mg.	Density.	Volume, ml.
No. 4 = K	— 0.0857	21.5436	46.4176
.. 20 = K	— 0.0398	21.5509	46.4017

These values of the national prototypes were determined at the International Bureau of Weights and Measures by a very elaborate series of comparisons between them and the international prototypes. In the above equations, the "micron" is the one-millionth part of a meter ; T is the temperature in degrees centigrade.

With regard to the cross-section of the meter, the form shown in Fig. 1 was selected as having the greatest rigidity for a given amount of metal, and at the same time because, allowing so much of its surface to be exposed, it was believed to be capable of assuming most readily the temperature of the surrounding air. The surface upon which the defining lines are engraved is the neutral plane of the bar.

The following comparison between the new prototypes and the metre des archives sets forth the advantages of the former :

RIGIDITY.		SUPERFICIAL AREA OF TRANSVERSE SECTION.	
New Prototypes.	Meter des Archives.	New Prototypes. Sq. Mm.	Meter des Archives. Sq. Mm.
25.9	1	150	100

The construction of these standards was completed in the autumn of last year, and those allotted to us were received by Dr. B. A. Gould, our representative in the International Bureau, and were by him turned over to the United States Minister at Paris, Mr. Whitelaw Reid. Meter No. 27 and kilogram No. 20, and also meter No. 12, of the alloy of 1874, were received from the United States Minister by Professor George Davidson, assistant in the United States Coast and Geodetic Survey, who brought these standards from Paris to Washington, where they were deposited in the Office of Weights and Measures. The utmost care was necessary and was shown in the transportation of these standards, and I am glad to say that they were received at the Office of Weights and Measures in excellent condition. On January 2, 1890, the meter No. 27 and the kilogram No. 20 were carried to the Cabinet Room in the Executive Mansion, where the ceremony of breaking the seals upon the boxes was performed in the presence of the President of the United States, the Secretary of State and the Secretary of the Treasury, together with a distinguished company of scientific men, including the presidents of the engineering societies of the country, and all leading exponents of the science of metrology.

A formal certificate, declaring the condition of these standards on the opening of the boxes, was signed by the President, and witnessed by the Secretary of State and the Secretary of the Treasury. A somewhat similar certificate was signed by all the other gentlemen present at the ceremony of breaking the seals. By this official act of the President of the United States, meter No. 27 and kilogram No. 20 are placed in a rank above that of any other standards which we now possess, and they will, therefore, be guarded as our national prototype meter and kilogram.

Meter No. 21 and kilogram No. 4 are still in the possession of the United States Minister at Paris, and will be brought to this country by a special messenger from the Office of Weights and Measures during the coming summer.

In conclusion, I beg to call attention to the models of the new standard meter and kilogram, which I have upon the table before me. The model of the meter is made of wood covered with aluminum, so that it resembles very much the platinum of the original, and as to dimensions, it is a very exact copy. It will enable you to see the form of the standard, and especially the interesting form of the cross-section which has been selected after much study and examination. The model of the kilogram is hollow, made of brass and plated with nickel, so as to resemble the platinum original. It resembles the latter, of course, only in form, but in that respect is a very exact copy, and will enable you to see that this kilogram is a cylinder, the diameter of which is equal to its altitude and the edges of which are very slightly rounded.

In thanking you for your kindness in granting me the privilege of discussing this question before you this afternoon, allow me to say that the Office of Weights and Measures will always be pleased to do anything in its power to further the interests of exact measurement in any operations growing out of the practice of your profession. We can determine the errors of zone standards of length, if you desire it, and of zone standards of mass also. We have recently published a two-page table for the transformation of the customary system of weights and measures to the metric system, and I have placed a number of these upon the table, which I should be pleased to have any of you appropriate when an opportunity is offered, if you so desire.

OPERATING NOTES.

BY L. G. BIGELOW.

[Before the Washington Convention.]

I will begin with the curtaining of the light. Nearly twenty years ago I advocated a system in which the curtains of the skylight were divided into six sections. The curtains were run on wires parallel with the side light. I believe this method gives better control of the light than by the usual way of curtains on rollers running from the lower to the upper side of the light—at least such is my experience. The side light for bust work should not be open except above five feet from the floor. In groups and full figures the light may be used much lower. We should always keep in mind that the general direction of the light falling on the subject should be about the angle of 45 degrees. This is of course varied for certain picturesque effects which the taste of the operator may devise.

I prefer ordinary white sheeting for the material for curtains, and on a north exposure one set is sufficient; but where much sunlight has to be shut out, two sets are found desirable. It is my custom to place the subject for ordinary portrait lighting a very little back of the center of the light, and for Rembrandt and shadow effects slightly forward of the center. The usual position for the Rembrandt light is to work diagonally toward the side light, but if brought forward as suggested it will be found that the finest results may be obtained working parallel with the light. An important feature in the production of fine portraits, and often overlooked, is the distance between the subject and background. If you want atmosphere and apparent space or perspective to relieve the image, you must have it, or the lens cannot produce it. Let plenty of light fall between the subject and ground and there will be a feeling of fine relief that is not otherwise obtained.

I am a great believer in the value of the head screen; and used in connection with a screen frame about 6 feet high by 3 feet broad, in which are hung two smaller frames supported horizontally at each end by pivots, which allows them to be inclined to any angle, and then covered with thin muslin. You will have in this combination the means of obtaining any desired lighting without

the use of curtains to the light. The reflecting screen should be in two sections, adjustable like the screen above described. One side should be covered with white muslin, the other side colored a light drab tint. A reflector is a necessary article, but its injudicious use damages a great many otherwise good negatives. The chief reason for sectional curtains, as described, is that light may be admitted from any direction and in any quantity desired, making the use of a reflector seldom necessary. Now, if any one will try covering the entire light with white curtains and will then take a negative; afterwards put back every curtain and flood the room with light, and then take another negative, giving the same time as before, develop them together, the result will be a lesson in lighting which will be of great value. The result will be that one negative will be soft and full of subdued detail, the other hard and lacking in full shadows. The one taken with the least light has the best time. You all know that a sun-lighted landscape requires more exposure to produce a soft negative than when the sun is veiled with light clouds. It is the same in studio exposures. Hence, use only a small opening of direct light, only enough to slightly accent the high lights. The result is perfect in modeling, and every way more satisfactory. Another way is to use the light uncurtained, then control the light with the screen before mentioned. In all bust work, for large sizes, I use the latter method. The idea I wish to convey is: use a soft, well-diffused light. It is more agreeable to the sitter, secures good modeling with short exposure, and saves greatly in the retouching. I notice of late a great stride in the right direction, and that is in the adoption of more simple designs for backgrounds. In many instances it has been a little difficult to tell which was the subject and which the accessory. In every detail of the business of the best galleries there is a decided improvement in an artistic sense. The new order of things proves one thing pleasant to contemplate, and that is, the beneficial influence exerted by the Photographers' Association of America.

I cannot forbear in this connection to mention another element which is contributing to the dissemination of knowledge among us, and that is "the Photographers' Free School." Now I don't think any of you ever heard of it before, but many of us have partaken of its advantages. The professors—well, perhaps that is too big a title, and might cause some of the gentlemen I see here to blush, so I will say instructors—are paid by such liberal men as Cramer, Seed, and Carbutt, and by the Eagle and Phoenix Companies.

I allude to the demonstrators, whose smiling faces you are not all of you glad to see, at all times; but I will say for you, as a rule, you treat them as gentlemen should. These men are selected as the best qualified to be had, to show the respective merits of their plates, and are usually capable and willing to impart their knowledge to any who ask.

A photographer who was called upon one day by a demonstrator said to him: "I will not buy of you. Yesterday you spent some time instructing Mr. ——. He is my competitor, and you have no business to do so." The demonstrator replied: "Does not the golden rule apply to photographers? You are a man who has grown gray in the business; he is almost a boy, and is working earnestly, if not for fame, at least to support a mother and young sister. If you feel like that, I don't think the house I represent would care whether you use their plates or not."

Now, as a rule, I think photographers are nice men; but you all know the old saying about the black sheep.

Photographs almost always lack the quality of breadth. There is too much prominent detail to satisfy the artistic taste. Greater breadth is imparted by softening the light and using large diaphragms in the lens. A picture requires breadth, because it then appeals to the imagination of the beholder. The richer the picture is in its suggestions the greater its merits as an artistic production.

I may illustrate by describing a painting representing a storm on the sea coast: As I gazed on the sky with its dark flying clouds, and on the waves dashed into showers of spray against the rocky shore, it seemed that I could hear the whistling of the wind and the thunder of the surf.

The sea line was scarcely visible, and in the breakers was the piece of a spar bearing a few broken strands of the rigging, all suggesting that the angry waters might conceal the story of a wreck with its attendant horrors. Now, on examining the painting closely, it looked as if it might have been done with the refuse of a house-painter's dried-up pots, and any kind of brushes, from shoe to brooms. As for detail, there was none, and yet, when viewed from the proper distance, the power of the scene thrilled one indescribably.

Now, although we are hedged about and limited by the powers of our lenses, yet we have the greatest things necessary—light and dry plates—and by their intelligent use we shall yet do far greater things than have yet been accomplished, and I believe the next exhibit of this association will prove it. We have all our lives been trying to see who should make the sharpest picture, and the lens-makers have helped us. That is all right, for we have demanded it. It is in this way we have discarded our best friend, breadth. Petty detail and breadth are mortal enemies, and the sooner we acknowledge the fact the quicker shall we see the artistic excellence of our work improve. Well, says some one, how can I get it? I say, cut loose from small diaphragms, and even then take a turn out of focus; study the effect. Give soft, rich lighting, simplicity in posing, and make your draperies fall in broad folds. Keep out of your pictures all big patches of white. Remember that flesh is never white under any circumstances, and neither is white to be represented white if in shadow. A very small space of white is a sufficient key for a large picture.

In the works of Adam Solomon we have the nearest realization of what I have attempted to describe. With the increase of knowledge and new appliances may we not hope for great things? A few days since a friend sent me an article entitled "Artistic Focusing." Some of you may have seen it. I hope you have. I think there is a wonderful field for thought and artistic culture in its suggestions.

I have had the entire article reprinted, and shall be pleased to present each of you with a copy after the adjournment of this meeting.

Bust Posing—45 degrees—varied.

Lighting for Half length

Full length

Hands, arms and feet.

} Draperies broad, following contour of the figure.

LIGHTING.

BY E. P. KING.

[Before the Washington Convention.]

THIS paper is not written with the idea of giving any of the older heads anything new, but as a starter, in hopes that we may hear from some of them, and get more practical ideas than I am able to give.

I was somewhat surprised at receiving a request from our worthy President calling for a paper on lighting, and no doubt you will all be glad to learn it was to be a short one.

The question is: What is lighting, and is it best to know it on scientific principles, or to train the eye to know when the lighting is correct?

Did you ever stop to think, while lighting a subject, why you move the curtain a trifle higher, or the side curtain a trifle lower, and see how long it would take to give a more satisfactory answer than that it did not suit your eye as it was, but by that movement it was satisfied?

Now, how can the eyes be trained? Of course, we must know the principles of light and shade first. These I do not propose to speak on, as it would take too much time, there being so many books published on this subject; so I will only give my own experience in study, and there may be a good point in it all somewhere, I hope.

After working at the business some time I found the only practical chance to study lighting was when some one was paying for what they thought a graduate's work (not a student's); and while making my sitting, my thoughts were so busy

on all details that I had no chance to give my eyes the necessary training, so I made and placed at a window a light about three feet long, in the same proportion to the one I was then working with, and used as my subject small dolls, and at my leisure, with my little dumb subjects, experimented with light, and in that way spent many a happy and profitable hour, and became quite in love with my models, because they never dictated to me, and not one of them ever said they would as soon have a tooth pulled as sit for a picture.

On the floor of my model light I made a large circle, and found by placing my subjects on and moving them around the circle, I had produced almost every light that is needed in portrait work. When tired of portrait work, I then tried fancy lightings and groups, trying to reproduce a light I saw in "So-and-so's" photo, or in a painting or a lighting in a street car.

Did any of you ever notice the number of different lightings you may see in a car? There are more chances to study good lightings there than many are aware of.

If I had an appointment with a subject where there was a chance to make something nice, I would get my little models and have a practice before the subject came, thereby ascertaining exactly what I wanted, and where to place my subject.

After learning my model light, I always seemed to have an imaginary circle in my operating room, and knew where to place a subject for any light I might want.

There is fully as much in lighting a face as in expression. If you take a subject with a drooping of the mouth on one side, or strong lines about the nose and mouth, and make what some call a "shadow light" (why they call it so I have never been able to find out), you will make the lines very prominent, causing more work in retouching, and not as satisfactory a finished print as if a plain soft lighting had been used.

In lighting white drapery I advocate posing the figure well under the light, and, with the use of the head screen and reflector, soften the lights on the face, only leaving the drapery strong and bold. Some operators object to the use of the screen or reflector. I have worked under lights where I found it unnecessary to use either, the light being ground glass and always soft. I have also worked under a clear, glass light, and used no screen, because my customers did not see the difference between a black and a white picture and one full of gradation, and I did not know the difference, so we were both happy, and our eyes satisfied; but as my eyes received more training I found I had to improve my work or close my eyes.

I once worked for a gentleman who posed a subject in a white dress about four feet back of the open light, and got a pretty light on the face by turning it from the light. But the drapery?— Well, when I had developed the plate it was condemned, because I had not made good in the dark-room what he had ruined under the light.

Now, my brothers in the profession, if you find anything in my paper that is weak and needs intensifying, do your intensifying.

THE DISPLAY OF APPARATUS AT THE WASHINGTON CONVENTION.

As is usual at these conventions, our publishers made by far the largest display of articles pertaining to the art of photography. From the little brass pendulum for measuring time of exposure to the latest improvements in the large cameras used in the modern studio of the professional, there was every conceivable form and size of appliance exhibited. We have not space to note all the novelties we saw, and can only mention the more important. In cameras we noted a new series of compact instruments having the good qualities of some of the English designs made yet more compact and useful by the application of American ingenuity. These were of the reversible back type without any pro-

jecting or loose screws, and were finished in the finest manner, both in the matter of brass and wood work.

Another advance in the same line was the Magazine hand camera. This is a box not any larger than the ordinary so-called detective camera, but capable of carrying twelve dry plates or twenty-four films at one time, and where each plate or film can be used without opening the camera or drawing a slide from a plate-holder. The working of the camera is the acme of simplicity, and involves but three movements: first, setting the shutter; second, making the exposure, and third, removing the exposed plate out of further action. This last step is so well arranged that it requires only the pressing of a single button, that causes the fall of the plate into a receptacle attached to the camera to receive it; while the same action exposes another plate ready to receive another exposure. There is no doubt that this invention will become popular as soon as its merits are understood.

The umbrella tripod was another interesting novelty exhibited by our publishers. This was a very compact form of support for the camera, which when folded up had all the appearance of an umbrella, and when opened formed a very steady camera stand. It was one that would interest the tourist and be appreciated by him in every case.

At this display we also found a number of interesting orthochromatic photographs, made from chromolithographs upon Vogel's eoside of silver plates. They were remarkable in the faithfulness with which they gave the relative light values of the original pictures, and were an object of interest to all who saw them.

Among objects specially interesting to amateurs in the same exhibit was the P. D. Q. camera, the latest addition to the class of hand cameras to be used with plate-holders. In this camera we found what is by far the simplest and most satisfactory of shutters. Its peculiar merit is that you cannot expose a plate while setting the shutter, and either time or instantaneous exposures can be made by the same motions, devices we have failed to find in other cameras of this kind.

Another piece of amateur apparatus in the same display is the little Simplex camera, an improved form of the Lilliput camera, with fixed focus lens and finder for taking twelve pictures $2\frac{1}{2}$ inches square, and using dry plates in regular holders. For the ladies and those wishing little gems of their rambles, this is indeed a very desirable piece of mechanism.

Adjoining the above display was the exhibit of the Blair Camera Company, where among the first objects to greet the sight were the signs "Hawk Eye" and "English Compact Cameras." These names are so familiar to all that it is unnecessary to more than mention them. This company, following their usual custom, had one of the largest and most interesting exhibits of the Convention. They displayed a full line of their well-known apparatus. Here was also seen a handsome case filled with Taylor & Hobson lenses, and for which the Blair Company are sole United States agents.

The Hawk Eye is now claimed to be among the most popular cameras in the market, the demand for them having been so large as to necessitate doubling the capacity of what was already one of the largest manufactories.

Buchanan, Bromley & Co., of Philadelphia, who have always been represented at the conventions, had on display a fine line of new goods of their own importation, including Japanese art tissues, Ajax, Leclair, Eclipse, Austrian

and Franco lenses, Franco camera levels, platinotype papers, professional masks and disks, magnesium powder. Also the following goods, for which they are sole agents: Albums for canvassers, Keystone vignettters, Universal vignettters. Keystone eye rests, photoscripts, Hale's toning powders, professional negative racks, pearl retouching leads, cabinet enclosures, emerald printing pads, Persian and Fairy draperies. Their exhibit was also the headquarters of the *Practical Photographer*, and other publications of Percy Lund & Co., of Bradford, England.

At this latter exhibit we also found a very large and handsome music box, whose delightful notes added much pleasure to the occasion. It is certainly an excellent idea to make these exhibitions attractive as well as business-like, and the mellow strains of the musical box is one of the simplest and most effective ways of doing it, especially when one of the handsome varieties is selected, as was the case in the exhibit of Messrs. Buchanan, Bromley & Co.

The Bausch & Lomb Optical Company was represented by Adolph Lomb and W. Drescher. In this exhibit were shown the Rapid Universal lenses, Alvan G. Clark lenses, iris diaphragm fitted to a Rapid Universal lens, special lenses for detective cameras, the new model diaphragm shutter, Hoover shutter, prisms for photo-mechanical processes, camera levels, focusing and retouching glasses, besides a large frame wherein photographs of different sizes were exhibited, showing the capacity of the lenses with which the same were produced.

The lenses and shutters are also made in aluminum.

The Acme Burnisher Company, of Fulton, N. Y., made a handsome display of burnishers. The great factory which has lately been completed to turn out these new appliances is 220 feet long and 50 feet wide, the motive power being water. Among the improvements in burnishers and paper-cutters which this firm is constantly introducing we note a new 8½-inch burnisher for small work, and also suited to the needs of amateurs. This is a burnisher that will take prints 8 x 10 and under. It is heated by gas or oil, and a thermometer is attached to regulate the temperature of the rolls. This is one of the best small burnishers that we have seen.

The Wilson-Hood-Cheyney Company had a large display of fine draperies, curtains, floor-cloths and rugs for the studio. Also Osborne's accessories and grounds, the small head and bust ground, and the new step and balustrade accessory, being especially novel and practical pieces of studio apparatus, and exhibited for the first time by this company. Mr. J. G. Hood was in charge, assisted by Mr. A. L. Bennett.

There are many more interesting exhibits to notice, but our space is already exhausted, and we must defer them until our next issue.

CONVENTION NOTES.

THE monument to Daguerre, erected in the Rotunda of the National Museum at Washington, is a remarkably beautiful piece of art work. It stands 16 feet high, and the granite, quarried from the celebrated rock of Quincy, Mass., weighs 15 tons. The base is of rough granite and the pedestal finely chiseled, while the sphere exhibits the sea on a finely polished surface, the land having a matt surface—a remarkably effective device. A pair of tablets on the base have a polished groundwork with the following inscription in matt surface letters:

"To commemorate the first half century of photography, 1839-1889. Erected by the Photographers' Association of America, August, 1890."

"Photography, the electric telegraph, and the steam-engine, are the three great discoveries of the age. No five centuries in human progress can show such strides as these."

On the pedestal is the word "Daguerre," in bold old lettering.

The head of Daguerre, the figure of Fame, and the wreath, are in warm-colored bronze, giving an exceedingly beautiful contrast against the cold greenish blue of the Quincy granite. We cannot conceive anything more beautiful than the effect produced by this contrast, or materials that will better stand the test of time. For ages to come these must endure to tell to future generations that the photographers of the Western World remembered the father of our art, and proud will be the sons and daughters of those who, even in a small way, helped to erect this tribute to the memory of Daguerre.

ONE of the interesting events on the occasion of the unveiling of the monument was the presence of a number of the veterans in our art upon the rostrum with Secretary J. W. Noble and the officers of the Association. Among those present were S. M. Fassett, of Washington; T. C. Roche, New York; E. Long, Quincy, Ill.; M. Brady, of Washington; W. G. Entekin, Philadelphia; Robert Benecke, St. Louis; C. Gentilé, Chicago; G. W. Davis, Washington; H. A. Balch, Washington; John R. Clemons, Philadelphia; E. F. Feiger, Pomeroy, Ohio; F. M. Schleier, Washington; A. J. Riddle, Columbus, Ga.; J. L. Lovell, Amherst, Mass.; Joseph Slater, Franklin, Ohio; Frank Pickerell, New Jersey; G. S. Cook, Richmond, Va.; E. Stanton, Toronto, Canada; W. V. Ranger, Syracuse. There were also present: Ex-Governor Fletcher, of Missouri; W. V. Cox, Chief Clerk of the National Museum; Professor T. W. Smillie; Mr. Scott Hartley, and the representative of France, M. Jules Bœufvé, Chancelier de la Legation de France.

ANOTHER very pleasant event of the trip to Washington was the special opening of the Corcoran Art Gallery for the benefit of the members of the Photographers' Association of America. During the summer months this beautiful collection of pictures is closed to the public, but owing to the kind offices of Professor Smillie, a special permission was granted to the members of the Association, and those who availed themselves of the opportunity will have reason to remember the visit for many years to come.

ON the Saturday after the closing of the Convention, quite a large party made a trip to Mount Vernon, the resting place and old home of George Washington, where many objects are found that are food for meditation.

As is usual on these occasions, the BULLETIN headquarters was the rendezvous of many old and valued friends of the journal. We cannot attempt to name all the good and hearty handshakings that we received, but can only assure all our friends that these annual greetings seem increasingly pleasant as the years roll on.

WE are especially thankful to Professor F. W. Clarke, the Chemist of the

National Museum, for kind attentions, also to Professor Romyn Hitchcock. Professor T. W. Smillie made us happy in many ways, and his department and warm reception will always remain a bright memory of the Convention of 1890.

THE following is a partial list of the contributions to the Daguerre monument as far as we have received notice of them up to this date. We shall take pleasure in adding to this list as the names are sent to us. These are in addition to the money raised by dollar subscriptions :

Dr. A. H. Elliott, \$25 ; G. Cramer, \$500 ; E. & H. T. Anthony & Co., \$500 ; W. V. Ranger, \$10 ; W. G. Entekin, \$100 ; C. H. Codman & Co., \$100 ; Benjamin French & Co., \$100 ; G. Gennert, \$50 ; Rhinehart (City of Denver), \$50 ; Sheen & Simpkinson, \$25 ; D. P. Thompson, \$25 ; L. W. Seavey, \$25 ; Hetherington & Coover, \$25 ; *St. Louis and Canadian Photographer*, \$25 ; S. J. Dixon, \$25 ; G. D. Milburn, \$25 ; Brodie Mfg. Co., \$25 ; John W. Morrison, \$25 ; D. R. Coover, \$25 ; Fowler & Slater, \$25 ; Catherine Weed Barnes, \$20 ; S. L. Stein, \$20 ; L. C. Overpeck, \$10 ; L. J. Ullman, \$10 ; Mr. A. J. Riddle, \$10 ; *Photographic Herald*, \$10 ; Ph. Bonte, \$10 ; J. R. Pearson, \$10 ; Baker's Art Gallery, \$10 ; F. E. Hastings, \$10 ; Buffalo Argentic Paper Co., \$10 ; J. G. Edgeworth, \$10 ; E. M. Estabrooke, \$10 ; Loney & Gable, \$10 ; E. J. Pullman, \$10 ; G. H. Van Norman, \$5 ; W. Stuber, \$5 ; E. Stanton, \$5 ; J. M. Brainerd, \$5 ; E. Fieger, \$5 ; A. W. Judd, \$5 ; Eddy Bros., \$3 ; G. L. Hurd, \$2 ; T. M. Mackey, \$1 ; J. R. Clemons, \$1 ; Bausch & Lomb Optical Co., \$20 ; J. M. Appleton, \$25 ; M. A. Seed Dry Co., \$100 ; R. H. Moran, \$25 ; Geo. Murphy, \$20 ; F. W. Guerin, \$10 ; Arthur, \$10 ; C. Gentile, \$10 ; C. W. Motes, \$10 ; Benjamin Brothers, \$5 ; Elrobor, \$5 ; E. Decker, \$5 ; S. B. Brown, \$5 ; Eugene Smith, \$5 ; F. Plotser & Co., \$5 ; M. G. O., \$2 ; Geo. Sperry, \$2 ; Adam Heimberger, \$2 ; Charles E. Craven, \$2 ; J. E. Smith, \$2 ; J. C. Fitzgerald, \$2 ; W. E. Eusten, \$2 ; W. Noel, \$1 ; L. M. Jackson, \$1 ; S. F. Sloan, \$1 ; A. M. Wiggins, \$1 ; J. W. Vance, \$1 ; A. M. Collins Mfg. Co., \$100.

In addition to the above Mr. G. L. Hurd, and Dr. A. H. Elliott, of the BULLETIN, collected subscriptions to the amount of about \$130, the names being handed to Mr. H. McMichael.

Mr. G. H. Hastings, of 147 Tremont Street, Boston, contributes one-third of the gross sales of the unmounted groups taken at Boston.

Mr. E. J. Pullmann, of 935 Penn Avenue, Washington, has made an excellent cabinet picture, also larger sizes, of the finished Daguerre monument, copies of which are before us, and every one sending him one dollar for the fund will receive a copy of the cabinet size.

THE general public interest that was taken in the meetings of the Association at Washington was quite marked. Between twelve and fifteen hundred people visited the National Museum on the days of the sessions, and on the day of the unveiling of the Daguerre monument over five thousand persons were admitted. These results must be very flattering to the Executive Committee.

Those who did not attend the Washington Convention can obtain a copy of the photograph of Daguerre, which was given away, by applying to the G. Cramer Dry Plate Works, St. Louis.

BLISTERS.

To the Editors of the BULLETIN :

I see many of your readers ask for a preventive for blisters. Now, I will not go into a scientific explanation of the cause or remedy, for I do not know either, but I will give what practical experience has taught me will do the business.

Starting with a clean silver bath, either of new silver and water, or an old one boiled down and fused, I put in an excess of ammonia, enough in the case of new silver to cause a heavy precipitate. I then add nitric acid sufficient to make it clear and very acid to litmus paper. Then I add gradually ammonia again until the solution becomes slightly alkaline to litmus paper. Too much ammonia will injure the surface of the albumen paper when floated.

Theoretically, nitrate of ammonia ought to do the same work as the nitric acid and ammonia, but somehow it fails to "git thar" with me. By practising the above method I have never had blisters for more than one day at a time for the past eight years, and on any kind of paper, although they will sometimes appear for one printing.

Respectfully yours,

W. W. WHEELER.

THE LANTERN AND THE SCENE PAINTER.

To the Editors of Anthony's Photographic BULLETIN :

GENTLEMEN,—In your indispensable journal of August 9th, you suggest the use of the optical lantern to scene painters for the purpose of enlarging their sketches. Let me say that I used the lantern for such a purpose long ago, and the beautiful drop curtain of the Broadway Theater is a wonderfully good illustration of its efficiency. It is a copy of a famous French picture which was made into slides *en gross, et detail*, and thrown on to the immense canvas in light and sketched by a corps of artists. This use saved an enormous expense and much time. The former method was to divide the sketch or design into squares and tediously draw the same into enlarged squares. I received many thanks from the artists for the suggestion. I often use the same method—lantern slides—for making outlines on canvas for oil portraits.

Yours very sincerely,

GEORGE G. ROCKWOOD.

OUR ILLUSTRATION.

THE handsome frontispiece of this issue of the BULLETIN is from the studio of F. W. Guerin, of St. Louis, Mo. As a study in posing it is remarkably graceful, and is worthy of the best attention of those who care to advance the art of photography. In justice to Mr. Guerin we will say that the picture has lost a little in the copying, as we could not obtain the magnificent original negative and had to be contented with a fine print from which to make a large number of negatives to produce the illustration for a single issue of this journal. The copying has been done very carefully and is very good; but our subscribers can well conceive of the beauty of the original when we are able to present them with such a handsome copy.

In a cat-fight the victor generally wins by a scratch.—*Philadelphia Times.*

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.
and a corps of practical assistants.

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E. & H. T. ANTHONY & CO., Publishers.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

THE first autumn meeting of the Section was held at its rooms, 111-113 W. 38th street, on the evening of September 2d. After acknowledging receipt during vacation of numbers of Anthony's BULLETIN, *Photographic Eye*, *Photographic Times*, *Journal of the Photographic Society of Great Britain*, and other communications, reports of committees and other routine business, Mr. A. D. Fisk exhibited a new flash lamp of simple construction and small cost. The device consisted of a wooden handle about 10 inches long and 1 inch in diameter, and about one-half its length was bored out to form a receptacle for the flash powder, which was retained by a rubber stopper, through which passed two small tubes, one for the hose attached to the ordinary rubber bulb used for camera shutters, etc., and the other having a flattened mouthpiece for distributing the powder when blown from the receiver by pressure of the bulb. The igniting flame was from a small wick-packed metal cup held in a suitable position by a wire attached to the before-described handle. The

wick being saturated with alcohol and the powder blown through, produced a light which the exhibitor reported to be quite effective. By increasing the number of flame cups and adding a reservoir bulb for higher air-pressure a greatly increased volume of light could be produced.

Mr. Fisk also exhibited the model of a new magazine hand camera which had several novel features. The plates or films were placed in a chamber at the back of the box, and were brought into position in focus, exposed, placed in another chamber, and the shutter set for the next exposure, all by a single up-and-down motion of a lever on the side of the box. Mr. Fisk stated that as many as twenty-four exposures could be made in the space of eight seconds. The model had been used in photographing a child in the act of jumping from an ordinary chair to the floor, and between the time the feet left the chair and reached the floor four good pictures or exposures were secured.

Mr. T. C. Roche exhibited a series of fine landscape prints from negatives on Anthony's films. For soft yet brilliant and delicate effects, they were remarkable, and elicited most favorable criticisms from the audience. Mr. Roche also exhibited two large sheets of prints from negatives by various processes in illustration of the advantages gained by the use of the orthochromatic or color-sensitive plates prepared by Dr. Vogel's method. In calling attention to the marked superiority of the prints from the Vogel plates, Mr. Roche gave a short description of their use and a list of subjects for which they were peculiarly adapted. A lantern exhibition was then given by Mr. Fisk, who, with others, furnished a very interesting and instructive series of slides, artistic and scientific.

At the close of the lantern exhibition the Society of Amateur Photographers extended to the Section an invitation to visit it and inspect their newly fitted rooms immediately after adjournment. On motion, the invitation was unanimously accepted, and at a quarter to ten o'clock the Section adjourned until the first Tuesday in October, after which the members proceeded to the rooms of the Amateur Society, where an hour was pleasantly passed in examining the fine display of pictures and the many conveniences for photographic work which the Society provides for its members.

A SCHOOLBOY, being asked in an examination to state the significance of LL.D., wrote: "LL.D. stands for lung and liver doctor."—*Engleide*.

THE CALIFORNIA CAMERA CLUB.

THE California Camera Club held its regular meeting in its rooms in the Murphy Building, San Francisco, August 27th. Considerable interest was manifested in the meeting, both from the fact that it would be the last meeting of the club in those rooms prior to their removal to the new quarters, and also because of the preliminary exhibition of lantern slides that were made for the purpose of selecting views for the triplicate set which the club makes to exchange with the Eastern and European circuits.

The club was called to order by President George W. Reed, and Secretary T. P. Andrews read the minutes. The following new members were elected into the fellowship of the club: W. Gerstle, Morgan Backus, O. H. Greenwald, Mrs. E. Fretwell and A. Gerberding, the addition of these new names making an active membership roll of 130 names.

Some sixty views of subjects in and around San Francisco were thrown on the canvas. These views had been selected for the exchange set by a committee, out of the multitude of views of San Francisco subjects owned by the society. The sixty selected were very fine, and the selection was at once approved of by the society.

Some twenty-six of the negatives were views of Chinatown, and were selected out of some 2,000 negatives collected by T. P. Andrews during five months' work in Chinatown. They were all taken by flash light, and show the life of Chinatown with startling fidelity.

These sixty views will be triplicated. One set of copies will be sent to Europe for the use of the European Amateur Photographic Circuit; another set will be sent to the Eastern Amateur Circuit, and the third set will be given to the California State World's Fair Convention for use at the World's Fair.

After these views were disposed of a series of scenes depicting the Paris Exposition were thrown upon the canvas. This series comprised fifty-nine views. They were very fine indeed, and gave a faithful idea of the chief points of interest in that big show. It took about an hour to show them all.

After that a series of views portraying the interior of the club's new rooms in the Academy of Science building were shown. The club has a suite of nine rooms in this new building, which comprises a library, reception-room, meeting-room, directors' room, lantern-room, enlarging-room and dark-room.

The new quarters will be the finest amateur

photographic club-rooms in the world, and will be fitted out with every modern appliance and convenience for the photographic work of the members. A distinguishing feature will be a complete electric-light apparatus, so that those of the members who by reason of business interference cannot prosecute amateur photography in the daytime may have every facility to do the work at night. Another feature will be a complete photographic library, in which every work bearing upon the science will be found.

The club has in preparation a series of views showing a trip through the Yosemite Valley, which, when completed, will be the finest illustration of that region extant. They also have several other series in preparation. All of these will be exchanged with the Eastern and European circuits.

It was decided to charter the tug "Active" on the 8th of September for the club's annual marine day outing. Over 120 cameras will be on hand, ranging in size from the smallest kodak to the huge No. 18 x 22. It is expected that any part of all outdoors which comes within range of these cameras and escapes being "taken" will have a monument or a whistling buoy placed upon the spot in commemoration thereof.

THE TORREY BANKRUPT BILL.

UNITED STATES District Courts have original jurisdiction, but State courts may try controversies involving property.

Referees are to be appointed and their territory assigned by circuit courts at a time when the district judge is on the bench.

Trustees will be appointed by the creditors.

The referee shall cause an expeditious and economical administration of the estate, and return the records into court.

The trustee shall reduce the estate to cash and distribute it in dividends to the creditors as soon as possible.

A \$10 fee shall be paid when the petition is filed. The Government shall receive 1 per centum on dividends paid by estates, and half that amount on amounts paid in composition.

The trustees shall receive from the estate 5 per centum of the first \$5,000 paid out in dividends, 2 per centum on the second \$5,000, and 1 per centum on additional amounts. The referee shall receive not to exceed \$1,000 per annum and a \$10 fee in each case. Both amounts, together with his expenses, are to be paid by the Government.

The number of referees shall be one for

each judicial district, and such additional number as may be necessary to expeditiously transact the business of the court, not to exceed 330.

Acts of bankruptcy shall consist of (within six months before the filing of a petition in bankruptcy) concealment to avoid the service of a civil process; removal of property to prevent its being levied upon; departure or absence with intent to defraud or delay creditors; failure for thirty days to secure the release of property levied upon; making a conveyance with intent to defraud or delay creditors; making a written declaration of insolvency; making an assignment; procuring a judgment or suffering a judgment with intent to defraud or delay creditors; suffering an execution to be returned unsatisfied; suspending and not resuming payment of commercial paper for thirty days; voluntarily petitioning to be adjudged a bankrupt; making a conveyance or suffering property to be taken while insolvent for the purpose of giving a preference; or dealing in options while insolvent.

A person who owes \$500, except a national bank or a municipal corporation, may become a voluntary bankrupt.

A person who owes \$500, except a national bank, a farmer, a municipal, charitable, or religious association, or a wage-worker, may become an involuntary bankrupt.

Compositions may be confirmed after, but not before, the bankrupt has been examined in open court or at a meeting of creditors, and after the filing of the schedule and list of creditors. The court will not confirm the composition unless it is for the best interest of all the creditors, and unless the bankrupt has not been guilty of any acts which would debar his discharge. They will be set aside within six months after being made, in the event fraud was practised, upon the hearing for confirmation.

A discharge shall be granted to a person, not a corporation, when applied for after two and within six months after the adjudication, unless it appears that the bankrupt has failed to keep proper books of account; committed a felony; committed perjury; failed to act in good faith; given a preference which has not been surrendered; knowingly made a false statement to secure credit; bribed any officer or creditor; fraudulently transferred property which has not been surrendered; or neglected his duties as a bankrupt. The discharge will be set aside within two years after being granted, upon proof that it was fraudulently obtained.

The exemptions of a bankrupt shall be the same as are provided by the laws of the State in which the proceedings are pending at the time of the filing of the petition.

Preferred creditors are those who have within four months before the filing of a petition procured property from an insolvent with intent to defeat the operations of this act; to obtain a greater per centum than other creditors; or to prevent the property from coming to the trustee in bankruptcy. If a preference has been given, the property or the value thereof may be recovered by the trustee.

Debts which have priority are those which are due as taxes when there is no property subject thereto. Other debts having priority are the clerk's fee; the per centum fees; the cost of administration; wages due employees according to the laws of the States, and debts which have priority under the laws of the United States.

Dividends shall be declared and paid of an equal per centum on all allowed claims of the same class as soon as possible.

Liens obtained by compulsory process within four months before the filing of a petition in bankruptcy shall be dissolved by an adjudication. Liens given prior to an adjudication in good faith, and not in contemplation of bankruptcy and for a present consideration, shall not be affected by this act.

Provisions are made for filing petitions; the insurance and return process; the making of adjudications by the court, or in the absence of the judge the transfer of the case to the referee; the taking of appeals and issuance of writs of error; the arbitration or compromise of controversies; the examination of bankrupts and other persons concerning the affairs of the bankrupt; jury trials, notices in newspapers, taking oaths, making rules, forms and orders by the Supreme Court; computation of time; the giving of bonds by referees and trustees; punishment for contempt; the punishment of crimes made by persons, bankrupts and officers; the death of trustees or bankrupts; the collection of bankruptcy statistics; the qualification of referees; the manner of keeping records of referees; the arrest of the bankrupt and the seizure of his property; the giving of notice to the creditors; the filing of petitions against bankrupts; the proof of claims; liquidating unliquidated claims; the qualification of voters at meetings of creditors; investment of cash in certain cases; the designation of depositories for funds; the disposition of unclaimed dividends, set-offs, counter-claims, and the transmission of the bankrupt's title to property.

The acts shall go into effect, as to the promulgation of rules and appointment of referees, upon its passage, and into full effect November 1st next.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—C. E. V. writes: Can you give a formula for a reducer that can be successfully applied locally with a brush? None of the usual reducers (ferric cyanide, cupric bromide, etc.) yield good results in my hands when used in this way. There was formerly an excellent preparation of this kind on the

market, but it is not to be had now. Do you know of what it consisted?

A.—Try potassio-ferric oxalate, as given in a recent number of the BULLETIN, and recommended by Belitzki under the title "The Green Durable Reducer." (See BULLETIN, July 12th, page 394.) Another good method is to use a solution of calcium hypochlorite (chloride of lime) applied locally with a brush. Make a strong solution of the powder and filter it. Add about three volumes of water to the strong solution before use. A few trials on some spoiled negatives will give the right dilution.

Q.—O. J. writes: On page 457 of the BULLETIN of August 9th there is a fixing and toning bath given in the article on miniature photographs which seems to lack the fixing ingredient. Can you supply the omission?

A.—The words "fixing and" in the paragraph you mention should be omitted. The bath is simply used for toning; the fixing must be accomplished in another bath of hyposulphite.

Q.—C. P. writes: Will you kindly tell, through the BULLETIN, which is the best way to develop instantaneous pictures with eikonogen—the object being to get the greatest detail and then work up the density? Also state which alkali is the most powerful to use with eikonogen, and the quantity of alkali to every grain of eikonogen. Should the negatives developed with eikonogen be strong and vigorous to get the best results on albumen paper as well as with Bradfisch artistotype paper? When negatives are too dense and require reducing, will it reduce the high lights without attacking the shadows? Is there any objection to adding a few grains of chrome alum to a hypo bath to which a little acid sulphite has been added for fixing negatives?

A.—The following formula, given in a former issue of the BULLETIN, has been used by us during the past summer with entire satisfaction, and gives good detail and plenty of density if the plates are allowed to stay in the developer long enough, and also if they have been properly exposed:

No. 1.

Eikonogen.....	1 part.
Acid sulphite.....	1 "
Water to make.....	80 parts.

No. 2.

Potassium carbonate....	3 parts.
Water to make.....	10 "

Use 1 part of No. 2 to 8 parts of No. 1, and a few drops of potassium bromide (1 in 10). Potassium carbonate is more powerful than sodium carbonate when used with eikonogen, but it readily produces frilling if too much is used. Strong and vigorous negatives, without stains, always give the best prints. When reducing you attack and reduce the shadows as well as the high lights. You can do no harm by adding chrome alum to the acid sulphite and hypo bath.

Q.—G. H. A. writes: Will you do me the favor of answering the following questions through the BULLETIN? 1. What diameter of condensing lens must I use to enlarge a negative up to 9 feet square in a magic lantern? 2. A quarter portrait lens is used in some lanterns; now, if the front lens is reversed and used alone, will it not be possible to throw up a much larger picture, with equal brilliancy? 3. Would not a single view lens answer the purpose with a good condenser? 4. How can I prepare a suitable light for a lantern without using the costly oxyhydrogen apparatus? 5. About what difference does it make in the brilliancy of the picture whether it is seen on the same side as the lantern or on the opposite side?

A.—Use a condensing lens about half an inch larger than will cover the negative or slide. By using front lens of portrait combination alone, you will not get as great brilliancy as with both lenses in tube. Again, the picture as enlarged will be distorted. It is best to use a good quarter portrait lens in conjunction with a good pair of condensing lenses, sufficient to fully cover the plate to be enlarged. A single view lens will give you a good bright picture, but any straight lines in it will be curved in the enlargement, especially near the margins. An admirable substitute for the oxyhydrogen light, when the latter is not available, is Cooper's lamp in his enlarging lantern. It works with kerosene oil; but do not expect to get as white a light with any oil lamp as you would with the lime-light. With a good opaque screen the most brilliant effects are seen on the lantern side when projecting.

Q.—J. R. L. writes: Please let me know if acid sulphite is sold as a liquid? It is a new drug, and I do not see any account of it in the chemical books.

A.—In chemical books it would probably be called bisulphite. But the peculiar form of acid sulphite used in photography is a liquid that is imported from Europe and can be obtained from our publishers.

Views Caught with the Drop Shutter.

W. G. ENTREKIN, of burnisher fame, is also one of our best photographers, and has recently opened a new, large and handsome studio at 1700 North Broad Street, Philadelphia. We tender thanks for a handsome invitation to the opening on September 1st, and wish the new enterprise every success.

We have to thank our good friend, C. W. Motes, of Atlanta, Ga., for a kind invitation to the marriage of his daughter Mary Emma to Thomas James Delbridge, on September 10th, at Trinity Church, Atlanta. We wish the happy couple a long and happy life.

LETTERS patent have lately been issued to Emerson A. Gilbert, of Jamestown, N. Y., for an improvement in frames for coating aristotype paper, the frame being constructed with an open corner which allows the emulsion to flow or run off into a receptacle, thus insuring saving of material and even coating of the paper.

A FIRE broke out August 28th in the three-story brick residence and photograph gallery of John Getters, 2021 Frankford avenue, Philadelphia. It originated in the dark room on the third floor, and is supposed to have been caused by the overturning of an alcohol lamp. Before the flames could be extinguished they had communicated to the floor below. The entire upper portion of the building was completely destroyed, and the contents of the lower part of the house were destroyed by water. Among the articles burned were six large

cameras and all the negatives, besides the finished photographs. Mr. Getters places his loss at \$3,000, upon which there is an insurance of \$1,500.

MR. AND MRS. ALBERT HARRIS, of Detroit, will celebrate their silver wedding on September 15th. We have to thank Mr. Harris for kindly remembering us with an invitation, and regret that space and time will prevent us from availing ourselves of his kindness. May his future married life brighten from silver into gold, and the day come when we shall receive an invitation to that celebration also.

WE regret to have to record the death of Mr. J. O. BOSWORTH, of Denver, Colo., due to an explosion of chemicals, on August 4th last. Mr. Bosworth was a most capable as well as an extremely agreeable gentleman, and his loss will be mourned by a host of friends and acquaintances. Mr. Bosworth was President of the Denver Fireclay and Chemical Co., and also President of the Denver Natural Gas and Oil Co., both of which organizations have lost an earnest and valuable officer.

ALEX. L. PACH, of Easton, Pa., sends us a very pretty album of views of that city, Paxinos, and Lafayette College. These consist of excellent albertype prints of the principal residences of the citizens, views of Lafayette College and the most picturesque parts of the surrounding country. To those who are acquainted with Easton and around there, this will be a delightful souvenir, and is well presented.

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NATURE'S MIRROR.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor*.

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DIRECT POSITIVES BY DEVELOPMENT.

LOOKING over the last number of the *Journal of the Photographic Society of India*, we were greatly interested in a short editorial note to the effect that Colonel Waterhouse, of Calcutta, had succeeded in reversing the photographic image in the process of development. Since that time we have received from the gallant Colonel two specimens of photo-etchings from positives made in this way. The first of these is a copy of a lichtdruck by Schober, of Karlsruhe, originally taken from an oil painting, and the other is a copy of a photo-electrotype. These prints are untouched proofs made directly from positives, reversed negatives, by development with phenyl-thio-carbamide in the developer, and are remarkably good pieces of work.

The importance of this discovery, if found perfectly practicable, is very great, as it will afford a means of obtaining direct positives for photo-mechanical printing, and also for the production of transparencies and lantern slides without the necessity of making a negative and then copying—a process that nearly always fails to give all the details of the original negative.

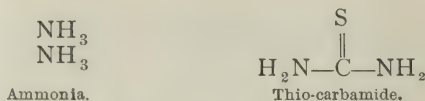
The method of procedure is a very simple one, and appears to work best with the newest organic developer—eikonogen. The thio-carbamide or sulphur-urea is added to the developer in very minute quantity, and has the remarkable property of reversing the ordinary photographic image impressed upon the gelatino-bromide dry plate, thus giving a positive instead of a negative picture.

Through the kindness of Colonel Waterhouse we are able to give our readers some of the latest developments of this method, and in the Colonel's own words, he having sent us advanced and fully corrected proofs of his article as it will appear in the *India Society's Journal*. We refer our readers to other columns of this issue of the BULLETIN for the details.

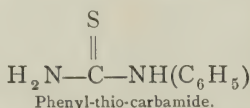
It may be interesting to stop a moment and learn the character of this new and remarkable agent, phenyl-thio-carbamide, now placed in the hands of the photographer for the first time.

Common oil of mustard is a sulphocyanide of allyl, and by the action of ammonia upon this substance sulpho (thio)-urea is formed. This compound is related to common urea, the principal constituent of the urine, the oxygen of the urea being replaced by sulphur; hence the name thio (sulphur)-urea. Again, urea is called carbamide, and since the new compound only differs from it in containing sulphur instead of oxygen, it is called thio-carbamide; thion being the Greek term for sulphur.

Looking at thio-carbamide from another standpoint, it may be considered as derived from ammonia by the union of carbon and sulphur, two molecules of ammonia giving up two atoms of hydrogen and uniting with sulphur by means of carbon, thus :



This gives us the nucleus or principal constituent of the new compound; but it is a special kind of thio-carbamide that is used, viz., phenyl-thio-carbamide. This is formed by acting upon aniline hydrochloride with ammonium thio-cyanate, and its composition may be represented thus:



The phenyl (C_6H_5) taking the place of one atom of hydrogen in thio-carbamide. This curious chemical compound, then, is also related to aniline, the source of so many of our beautiful dyes.

As there are a large number of organic chemical compounds closely resembling this new addition to the photographic laboratory, we may hope for some very interesting developments as they are experimented with. And we are very glad that some of our best workers in the advanced ranks of photography are turning their attention to the organic side of chemical research instead of re-working the much tilled soil of inorganic chemistry. We are satisfied that in the study of the effect of light upon organic compounds we shall learn more and more of the beauty of the colors of nature, and ultimately reach that dream of every thoughtful photographer, photography in natural colors.

EDITORIAL NOTES.

As an evidence of the value of photography in all branches of scientific investigation may be cited the fact that an appropriation of 3,000 marks has recently been made by the German Royal Academy of Sciences for the purpose of assisting Dr. A. Möller in a prolonged residence in Blumenau, Brazil, in the prosecution of studies and experiments pertaining to botany, during which course of study the Doctor intends to utilize photography principally for recording his observations. And for the purpose of perfecting himself in its workings he has lately devoted several months of close application in the photo-chemical laboratory of the Royal Technical High School in Berlin. Dr. Möller takes with him, in addition to several hundred dry plates, a large number of eosine-silver films.

THE photographers of Iowa have just finished their first convention, which it is intended to hold hereafter annually, in Des Moines. This movement, and a most commendable one it is, was started and fostered mainly by the efforts of Mr. John Virran, of the Robert Dempster Co., and Mr. S. H. Hutchings. The meetings were enthusiastically attended, and much benefit is expected to result from them to all who participated.

It is interesting to note, as we advance in scientific knowledge, how many of

the old so-called truisms are contradicted. For instance, there is one that the old school meteorologists long stood by, to the effect that lightning never turned back in its path; but photography shows that it not only does turn back, but that in so doing it quite frequently gets all snarled up in itself. And so it goes—what we learn to-day may be entirely disproved in the course of the next decade.

Now again the photograph has been ruled out of Court as evidence conclusive, in a recent trial for divorce before Judge Cullen, of Brooklyn, the prosecuting attorneys producing witnesses who positively identified the defendant by a photograph. Judge Cullen, however, quietly informed the prosecution that it would be necessary for the witnesses to personally identify the party in his presence. It is hardly likely that the same lawyers will make a similar mistake at present.

WE would note the receipt of two photographs from J. C. Avery, Jr., of Sedan, Kans., one of which, a group of Osage Indians, is particularly good. The group is at the agency, and immediately behind is the round house, in which the tribal dances take place, and which with its brush-thatched roof and thoroughly rustic appearance renders itself beautifully appropriate as a background; the other, which Mr. Avery asks us to criticise, seems to us to be somewhat lacking in ease and naturalness of posing, the lines of the arms and hands being rather too angular for perfect grace. In many respects, however, it is worthy of praise.

WE note with pleasure that the Society of Amateurs of Baltimore have formed a club in connection with the other work of the society, which has provided itself commodious quarters for practical work and experimental purposes. It is provided with dark-rooms and the necessary paraphernalia for photography, and is lighted by electricity. Much interest is being manifested in this departure, and the club is to be congratulated on its success.

WE learn from our exchanges that the President recently sent to the Senate the nomination of Theodore M. Schleier, of Tennessee, to be Consul of the United States at Amsterdam. Mr. Schleier is one of the veteran photographers of the United States, and was present at the recent convention in Washington.

THE recent burning of the Brooklyn Institute is a matter much to be deplored, resulting as it did in damaging so many choice collections and breaking up the work of the Institute so seriously just at the commencement of its busiest season. Work was, however, at once begun, with the object of losing as little time as possible in providing meeting places for the various departments temporarily. The Brooklyn Society of Amateur Photographers immediately tendered the use of their rooms to the photographic section, and it is probable that other organizations will follow their lead, so that the work of the Institute will suffer as little loss of time as possible.

It is affirmed that the process of making the peculiarly beautiful "azure" blue color so often met with in the ruins of Pompeii has been discovered by M. Fouque, the eminent mineralogist, who, by the mixture of the silicate of copper and of lime, has been enabled to produce this hitherto lost color, and that it is

perfectly unchangeable, and is identically the same as the Alexandrian blue known in Egypt under the Ptolemies and in Italy during the beginning of the Christian era.

WE would acknowledge the receipt of two fine specimens of Indian portraiture from the hand of Mr. Edgar J. Bonhore, of Lewiston, Idaho, one of which is a picture of Chief Joseph, so notorious in the Indian troubles of 1887. The other shows the typical Indian maidens of the frontier, and both are excellent examples of the art.

WE offer our congratulations to Mr. Baker, of the Baker Art Studio, of Columbus, O., on his having been awarded a diploma for the most tastefully arranged exhibit at the Washington convention.

WE learn from our exchanges that the New York Camera Club have arranged to give at their rooms on Fifth Avenue an exhibition of photo-mechanical processes, which will include specimens of all the leading reproductive processes of the day, such as photogravure, photo-gelatine and the various other half-tone methods, photo-lithography, photo-etching, etc. The exhibition is to commence November 3d and will last a week.

IN the recent competition under the auspices of *Frank Leslie's Weekly* over 5,000 prints were sent in by amateurs. A second competitive exhibit is now announced, in which over one thousand dollars will be distributed in prizes. This will close December 1st, and will be open to both amateurs and professionals.

THE manufacture of the films now coming so generally into use is carried on upon a table which has previously been covered with a preparation of ozokerite dissolved in benzine, the latter ingredient being then evaporated; the film solution, which is said to be composed of 9,000 grains soluble cotton, 5,400 grains camphor in 112 ounces methyl-alcohol, 28 ounces fusel oil and 7 ounces amyl-acetate, is then spread upon the prepared table with a special sprinkler. The film is then washed with a weak solution of sodium or potassium silicate, when it is dried and is ready for coating. These films should be no more than from .003 to .005 inch thick.

MR. AUSTIN P. NICHOLS, of Haverhill, Mass., sends us a fine specimen of work made with a wide-angle rectilinear Dallmeyer lens in which the depth and fullness of detail is wonderful. We cannot but add that Mr. Nichols' selection of a subject does him credit and ought to put any lens on its best behavior, the composition being well chosen and very artistic: a field of tall swamp grasses and cat-tails forming the foreground, with river and rustic bridge for middle distance and overhanging trees in background.

OUR good friend Dr. H. Carrington Bolton has recently returned from the Sandwich Islands and brings back much information both of scientific and photographic interest. He gave us a call the other day, and speaks very enthusiastically of the trip he has taken, and also of the members of the San Francisco and Hawaiian Camera Clubs, which he met during his journey.

MR. A. W. RICHARDSON, of the Hawaiian Camera Club, sends us some handsome 8 x 10 views of Hawaii, which reached us through the kindness of

Dr. H. Carrington Bolton. These views consist of tropical scenes, showing the bananas, cocoa-nut palms, paw paw trees, and algeroba; all curious and uncommon subjects for the lens of an American camera. One of the views shows the li vine in Hilo woods, Hawaii; another gives a scene on Mr. Sunter's embyro coffee plantation. In the latter case the proprietor is endeavoring to cultivate coffee in the islands, and has built a house upon the ground selected in order to superintend the operations personally. Mr. Richardson's photographs are uncommonly good, and we shall treasure them as souvenirs of our far-off friend, to whom we tender our best thanks for remembering us.

At the recent meeting of the Photographers' Association of Canada the following officers were elected for the coming year: *President*—C. S. Cochrane, Hamilton; *First Vice-President*—T. Cooper, London; *Second Vice-President*—J. C. Walker, Brantford; *Third Vice-President*—W. E. Eddy, London; *Secretary-Treasurer*—E. Poole, St. Catharines. The meeting in Toronto was a very enthusiastic one, and Hamilton, Ontario, has been selected for the place of reunion next year. Much of the success of these meetings is due to the energy of such men as Dixon, Poole and Stanton, and we hope their efforts will result in a much larger organization as time goes on, and that the Association will live for many years of usefulness.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Restoring Exposed Plates—Warnerke's Luminous Table—Films in a Tropical Atmosphere—The Value of Decoudin's Photometer—New Magnesium Powder for Enlargements—Stereoscopic Effect in Lantern Pictures.

THERE are certain photographic tales which pass from mouth to mouth and find a good many believers, and to these belongs the assertion that we are able to restore an already exposed plate so that the image impression disappears completely from the sensitive film by placing the plate in a weakly acidified bath and sending an electric current through the latter for a prolonged time.

The Paris *Figaro* mentions still another process by which one should likewise be able to restore an already exposed plate.

This matter has, undoubtedly, its significance. It will happen to the best photographer, when he is in a great hurry, that he may get two pictures on the same plate, whereby the latter, of course, becomes useless. On the other hand, when traveling, two negatives are oftentimes made of the same subject on account of the uncertainty in the time of exposure, which changes according to the height of the sun, cloudiness, etc. If the first of these plates is developed and proves to be good, the second is considered unnecessary and is laid aside; it becomes, therefore, a useless sacrifice.

The process mentioned in *Figaro*, to treat plates of this kind so that the image impression disappears, the plate, therefore, being restored for a new view, consists in bathing the plate for two to three minutes in a three-per-cent. solution of bichromate of potassium, after which it is well washed and dried.

Dr. Riesenfeld has made a test of both manipulations. The electric current, in gradation from the bare immersion of an element to the full immersion of six large Bunsen cells at a duration of from two minutes to half an hour, gave com-

pletely negative results. Bichromate of potassium gave also no satisfactory results. In a few cases the picture disappeared completely; but as a general thing the picture would appear in the development, even if very faint. Additional bromide to the bichromate bath had no influence.

My views are that all experiments to restore a plate are not worth more than that to restore a cartridge which has been shot off once. The labor is more expensive than all results.

Lately the usefulness of the Warnerke sensitometer has been more closely investigated. This little instrument is spread over the whole world, and I find the scale of the same to be very good.

I only could not befriend myself with the luminous table, particularly because it emits blue light, and because its brightness is not constant. But to determine definitely its usefulness I handed the table to Professor Leonhard Weber, who is considered first authority with regard to photometry. He has made experiments with the luminous table, and in consequence thereof he declares: That the table loses its brightness very quickly after exposure. In the critical half-minute during which the exposure takes place the brightness sinks on the average from 100 to 65. The absolute brightness is also strongly influenced by the manner in which the exposure takes place.

The table can, therefore, not be considered as a normal light-source. A normal lamp of Hefner, filled with amyl-acetate, is much more suitable for this. According to the most exact investigations, this is considered the best light-unit at present existing.

The film question is discussed here at present pretty lively, particularly since their manufacture in Germany by Perutz in Munich. They are color-sensitive. A holder has now been constructed which will hold twenty-four $6\frac{1}{2} \times 8\frac{1}{2}$ films, making the long rolls superfluous. About the usefulness of this instrument I will report at some later time, after I have been able to give the same a thorough test.

The durability of films in a tropical climate was the subject of discussion here recently.

To determine the same in the interest of a Brazilian expedition a Stegemann holder, filled with a sample of two color-sensitive Perutz films (with glass backing), was put in the conservatory of the Imperial Technical High School at a temperature of 28 degrees C. on the 28th of June and left there until the 12th of July—therefore eighteen days. After this time the slide moved a little harder than ordinarily. The films appeared partly matt, but were just as smooth as before. Being put into the holder without any support, they stuck somewhat to the wood of the holder, but could easily be detached from the same. They were developed with hydroquinone, and gave blameless pictures without the least trace of a black edge. As a consequence of this successful test the expedition provided themselves with films.

Dr. Michalke, one of the most eminent young professors of physics, has made some experiments lately about the usefulness of the Decoudin photometer. The following doubts have been raised against its reliability:

First.—The eye, dazzled by the daylight, cannot correctly estimate.

Second.—The graduation of the apparatus is incorrect.

Third.—The apparatus gives the optical, but not the actinic, lightness.

Considering the first reproach, we can protect ourselves against this by pro-

longed practice and locating the apparatus immediately after putting the ground glass in proper focus under the focusing cloth. The apparatus should be placed as close as possible to the ground glass.

The amateur can make the graduation himself. One exposes at a certain height of the sun (about 45 degrees when the object and its shadow are of equal size) with a certain diaphragm upon a line drawing, newspaper or something similar, and the position is marked at which the transparent points of the photometer just disappear. On the slide of the plate-holder marks are made at about a centimeter apart each, and after the plate-holder has been put in its proper place the slide is drawn at certain intervals, centimeter by centimeter, so that one obtains upon the plates stripes of different times of exposure. The latter is chosen so that the middle stripe will show the estimated time of exposure, and that the first stripe is surely under, and the latter surely over, exposed. If, for instance, 30 seconds are estimated, the different times of exposure taken should be 5, 8, 13, 20, 30, 45, 67, 100 and 150 seconds, so that each following time of exposure is 50 per cent. higher than the preceding one. The slide is hereby opened at $150 - 100 = 50$ seconds, at further drawing out of the same, $100 - 67 = 33$ seconds, etc. When developing, one stripe will give the correct time of exposure, which is marked in the location of the photometer previously marked. It is sufficient to put marks on the photometer for three to four different brightnesses. For the intermediate brightnesses the marks on the photometer can be determined by producing different brightnesses upon the ground glass by changing the diaphragm, the relation being inversely proportional to the diaphragm-openings.*

This graduation of the apparatus would be good for a certain height of the sun. If the height is changed the actinic action changes to a considerably higher degree than the optical one. About the absorption power of the air for actinic rays a very few measurements have been made, so far. At vertical incidence of the sun the atmosphere will absorb about 0.20 of the red rays, 0.22 of the yellow rays, 0.30 of the green, 0.36 of the blue and 0.45 of the ultra-violet rays.

From this, the action of the sun's rays for the several colors at different positions of the sun can be calculated :

Height of the Sun.	Red.	Yellow.	Green.	Blue.	Violet.	Ultra-violet.
10 Degrees.	1.	1.	1.	1.	1.	1.
20 "	1.88	2.02	2.75	3.80	4.26	5.44
30 "	2.31	2.54	3.82	5.73	6.82	9.44
40 "	2.55	2.84	4.39	6.99	8.55	12.33
50 "	2.70	3.02	4.90	7.82	9.73	14.33
60 "	2.80	3.14	5.17	8.46	10.51	15.68
70 "	2.85	3.21	5.33	8.70	11.00	16.59
80 "	2.88	3.25	5.53	8.90	11.28	17.00
90 "	2.89	3.26	5.45	8.96	11.37	17.19

In this table the action of the sun's rays for the several sun elevations are calculated by giving the action at 10 degrees the figure 1. One sees that while the yellow radiation increases about three times at a sun elevation of 60 degrees,

* That the time of exposure at less brightness must be larger, as the calculation shows, is of not so much consideration, the question being only the insertion of intermediate members.

the ultra-violet radiation increases about sixteen times. As the yellow radiations essentially determine the optical, and the ultra-violet particularly the actinic, brightness, the actinic action of the sunlight is five times larger in proportion to the optical action at 60 degrees. If, therefore, the optical brightness were chosen as a measure to judge the time of exposure (by estimating the brightness of the picture upon the ground glass or focusing with a Decoudin photometer), we would expose five times too much at 60, if the time of exposure at 60 is correct.

These proportions are for a bright day. On dark, cloudy days, with increasing cloudiness, the condition of the actinic to the optical action increases, so that on such days the time of exposure can be taken relatively much shorter than shown by the Decoudin photometer.

On high mountains the light is also proportionally more actinic than in the valley below.

The coloration of the object is also to be considered, green-colored objects requiring, for instance, a shorter time of exposure than red-colored ones.

The circumstance is still of not so much importance that the law is not so strictly adhered to whereby at only half the brightness it requires double the time of exposure. The latter has to be increased when the brightness is reduced. This defect can be removed by the above-described graduation.

According to this, it seems, therefore, as if Decoudin's photometer were useless for photographic purposes. With consideration of the above circumstances this simple and handy apparatus should be capable of protecting against under or over exposure. In the table which accompanies the apparatus, it has been tried to remedy above defects by noting an unproportionally long time of exposure for only moderate brightness, to which Professor Weber has already called attention some time ago. The supposition was perhaps here principally that a reduction of the brightness was mostly caused by a low position of the sun, whereby the time of exposure has to be increased on account of the relatively less active action.

One point seems to have been overlooked here, and that is the artistic. This is simply a matter of feeling, and cannot be replaced by any instrument.

The greatest exertion is made now to simplify photography. Boxes are made for the amateur like the kodak, requiring nothing but to turn the roller and to pull the shutter. Whether the object has got the correct illumination or not, is of course not marked on the kodak, not to mention the artistic impression. The intelligent operator will therefore have enough yet to do.

It is the same as with the hunter. A gun is easily loaded and fired off, but it is more difficult to hit the mark. The smart hunter shoots the deer: the incapable and awkward ones will spend their powder on sparrows and cats.

The magnesium flash-light still occupies the minds of practitioners and scientists. Until recently the ordinary magnesium light was considered satisfactory, which, as is well known, is poor for yellow and red rays. Attempts are now being made to relieve this defect, and thereby magnesium light has become an important factor for micro-photography.

According to Dr. Röhmann and Dr. Galewsky, in Breslau, two powders proved to be particularly suitable for micro-photography. They are made in the following manner:

Powder I.—These mixtures are made (a) of perchlorate of potassium

and magnesium in proportion of 138:96 ; (b) of perchlorate of potassium and acetate of copper in proportion of 1108:724 ; (c) of perchlorate of potassium and sugar-of-milk in proportion of 831:342. *a*, *b* and *c* are mixed together in the proportion of 6:1.4.

Powder II.—Seven parts of perchlorate of potassium, 7 parts of neutral tartrate of barium, dried at 100–110 degrees C. ; 3 parts magnesium and 0.5 parts of chloride of sodium are mixed.

For the ignition of both powders a salt is used consisting of 1 part of sugar-of-milk and 2 parts of chlorate of potassium.

Powders I. and II. are completely harmless, and they explode neither by the hammer nor by slow heating. Powder II. is used in all such cases where the application of a yellow light filter would otherwise be appropriate.

A microscopic object is taken in the following way : For focusing the object a lamp serves as light-source (albicarbon flame), which is at the end of the optical table. By means of the condensing lens the picture of the flame is thrown upon the ground glass in the well-known manner, and by application of a Zeiss apparatus, and moving the achromatic condenser, it is projected into the flame of the object. The illuminating lens is now covered with a black cloth, and the powder-carrier is pushed to exactly the spot where the ground glass was previously. The carrier consists of an ordinary stand, which carries in a muffle a strong iron wire, at whose one end is fastened a 10 c.m. long and 4 c.m. wide piece of sheet iron with bent edges in rigid connection. Upon this sheet iron a suitable quantity of the powder is placed, and on the small side a small quantity of the igniting salt of the size of a pea is put. The focusing glass is now replaced by the plate-holder, the slide is drawn, and the salt is ignited with a match. In one to two seconds the colorless flash-powder is consumed ; the baryta powder burns a few seconds longer. Dr. Galewsky has shown a number of faultless negatives which were taken after this method with a Zeiss apochromatic of 2 mm. and angular aperture 4. They represent to some extent preparations of bacteria colored with fuchsin and methyl-violet, and partly colored and uncolored pieces of woven fabric.

According to the latest communications from Dr. Röhmann the strength of the above-described powder, consisting of magnesium, perchlorate of potassium, acetate of copper and sugar-of-milk, is not fully sufficient for thousand-times enlargements. In tests to obtain a greater light intensity I found that the simple mixture of equivalent quantities of magnesium (96 parts) and perchlorate of potassium (138 parts) is consumed, with development of only a moderate smoke, and produces a light of quite extraordinary strength when ignited by the before-mentioned ignition salt of 1 part sugar-of-milk, sugar, and 2 parts of chlorate of potassium. Equivalent to this "white flash-light" a "barium-chloride of sodium light" is obtained by mixing 10 parts of flash-powder with 0.5 parts of chloride of sodium and 1 part of a mixture of 285 parts of dry tartrate of barium and 138 parts of perchlorate of potassium.

Both mixtures produced at a thousand-times enlargement and a small diaphragm very handsome, strong negatives upon color-sensitive Obernetter plates.

Dr. Galewsky applied the white flash-light for portraits and obtained satisfactory results.

There is no doubt that this light is also suitable for ordinary enlargements, and it may find yet a more general application.

It has oftentimes been believed that it is possible to obtain a picture with stereoscopic effect if by means of two lanterns both halves of a glass stereoscopic picture are projected upon the same spot, so that the pictures cover each other. Such pictures were called photobinographs. Some asserted that they could actually see the photographic effect; others, again, denied it.

Schober, in Antwerp, has now tried the matter in a more successful way. He puts into the one lantern a green and into the other a red glass, and lets the spectator look through a green glass with the right eye, and through a red glass with the left eye. In this manner the right eye will perceive only the right half of the stereo picture projected through green, and the left eye only the left half projected through red.

The experiments which Schober demonstrated before the Antwerp Photographic Society are said to have been surprising.

BERLIN, *August*, 1890.

PLATINUM PAPER AND ITS DEVELOPMENT.

BY W. E. PARTRIDGE.

THE value and practical convenience of the new dry-process platinum printing paper has been very greatly underestimated both by the amateurs and the manufacturers and dealers. All have admitted that it would not "keep" with ordinary envelopes. It has been universally taken for granted that for preservation for even a week or two, a calcium tube was essential. Those most familiar with it have asserted that if kept open in the envelope for a week the beauty of the whites would be ruined, and that it was not possible, even by putting it under pressure, to preserve it in workable condition for more than two weeks. It would be difficult to say how much this has delayed the introduction of the new paper. For a long time these difficulties with the supposed necessity for a steam development prevented the writer from attempting to use the paper. About three months ago the remarkable success of an Indian photographer in Calcutta with the paper suggested that both process and paper had not been perfectly understood. Some experiments were then undertaken which have proved very satisfactory. The first paper was taken home upon Saturday afternoon, but no suitable opportunity for use occurred until the following Saturday, when prints were made in the usual way with considerable success. The printing should, however, be carried somewhat further than with the "hot process." At least this was indicated by the day's experience.

Several weeks passed before another opportunity occurred for printing. By this time the paper, when treated in the ordinary manner, gave the muddy prints which the directions speak of as following the entrance of damp. This paper, dampened by exposure to the steam of a kettle and then printed and developed by another exposure to steam, failed entirely. The whites were dark and smudgy, and the blacks were not strong. The paper was evidently in bad condition, and was much less sensitive than before. Recourse was now had to another method of working. The paper was put in the frame and printed until the picture was practically all out. It was, in fact, nearly as dark as was wanted. Then the paper was removed from the printing-frame, and instead of using steam or vapor for the development, it was laid face down in a bath of clean water. The image gained considerably in vigor, and the detail increased to some extent. The blacks came out beautifully, and the whole result was

satisfactory. The print was then finished by putting it into the acid waters. The resulting picture gave the feeling of an etching. The whites were good and the picture harmonious throughout, showing no sign of the expected muddiness. All that remained of the packet was treated in the same way, and was equally satisfactory in working.

Under such conditions the paper was as easy in working as ordinary blue prints. There was this difference, that the washing waters were acidulated. Sometimes even the final washing in clean water was omitted. So far, no trouble has arisen from this source, although in the face of all the authorities it would hardly answer to recommend such a practice.

The result of this experiment shows that there has been a great unnecessary fear in regard to the action of damp on the platinum paper used in the cold development process; that by using cold water for a developer it is possible to obtain satisfactory work after the paper has been kept unprotected for a long time; that for certain classes of work the water development is vastly better than the steam or vapor.

The only drawback to the use of this paper generally among amateurs appears at the present time to be the rapid and almost unheard-of increase which has recently taken place in the value of metallic platinum. The price of all its compounds has been correspondingly advanced. As an offset to this we have the results of Edison's investigations some years since in regard to the possible supply of the metal. He found, and so asserted in print, that the metal was fairly abundant, and that the production could be very largely increased under the stimulus of an increased and steady demand. It is to be hoped that this result may be speedily accomplished, for the new printing process is one which should be widely known and used, since it occupies a field altogether alone. Permanence, beauty, ease of application, vigor of print, convenience, speed, and a black-and-white tone, without the necessity of toning, are some of its advantages. Although not filling the whole of the requirements for a perfect printing process for amateurs, it has one of the largest lists of any process that has recently come into competition for the honors.

PHOTOMICROGRAPHIC LANTERN TRANSPARENCIES FOR HISTOLOGICAL TEACHING AND RESEARCH.

By MATT. HEDLEY, F.R.C.V.S., *Dublin*.

THE varied illustrative methods now before the public for the purpose of education in one or other of its branches have not any greater than the optical lantern. It appeals to all classes, from the youngest to the eldest, or the unlearned to the *savant*. Although for a long period it was but a scientific toy, chiefly used for the amusement of young people, yet it, with its many accessories, has for some time past emerged from this toyship, and now ranks high in all branches of education as a method not by any means below the recognition of those who advance with the world's progress.

The optical lantern has not been and is not now entirely dependent upon the photographic art for its popularity, although it must be admitted that the art has very materially assisted in the lantern's popularity. This advancement is to some extent attributable to the use of dry plates both for negatives and for lantern transparencies. These transparencies, however, do not convey all that is desired

of them. They lack color. To color such slides is usually a tedious and somewhat expensive adjunct, if it is intended that the coloring shall as nearly as possible represent the subject portrayed.

With regard to objects under the microscope used for class purposes in medical schools, they are generally stained sections of physiological, anatomical or pathological subjects. They are stained, in the majority of cases, with one, two or three stains.

Professor J. Alfred Scott, M.B., F.R.C.S., of Dublin, and Vice-President of the Photographic Society of Ireland, has of late been experimenting for the purpose of making colored photomicrographic lantern slides of subjects suitable for medical class illustration and having a very close resemblance to the objects as usually seen under the microscope after they have been stained. The following is a *précis* of a paper read by him before the British Medical Association, held at Birmingham, on July 30th, in which he carefully details the methods pursued to obtain the beautiful results which were exhibited to the members in illustration of his remarks :

During the autumn of 1888, some lantern slides, published by the Woodbury Company, were shown to me. Among these were a few anatomical preparations which strongly suggested to me the propriety of using such a means of illustrating my lectures, as the ordinary form of diagram is not satisfactory for many reasons. As there were not any anatomical photographs of any real use in the market, I had to devise a means of taking them. I know that there are many photomicrographic cameras made by opticians, but most of these appeared unnecessarily complicated, and I thought that some modification of a small camera I devised in 1883 might be adopted. This small camera was intended to fit on the top of the microscope, where it could be placed if anything notable were observed on the field. The plates were small, being $2\frac{1}{8} \times 1\frac{5}{8}$ inches—much too small for useful lantern slides. It was capable of taking sharp pictures. The camera used for all my subsequent work was practically the same camera, but elongated about 15 inches. This gave a picture about 3 inches square, and yet was sufficiently short to allow working all the microscope adjustments while focusing the picture. For convenience and steadiness the camera (except in special cases) was arranged parallel with the table instead of being placed on the microscope, and regardless of the position of the latter.

At the outset it may be well to disclaim any idea in connection with these slides to be shown other than that of lecture diagrams. In many cases detail, etc., was deliberately suppressed and some appearances exaggerated to make the remainder more diagrammatic, but there was nothing more done than would be allowed in the staining and mounting of the specimens had they been specially prepared with the intention of taking photographs from them. Some which were mounted with that intent were so stained as only to exhibit the particular point wished to be shown and to keep the remainder of the tissue only suggested.

The actual photographic work was in most cases easy, the ordinary methods being employed; in other cases, however, the special isochromatic plates were necessary on account of the stain employed in mounting the sections.

The greatest difficulty was in the selection of the objects to be photographed. We all know that it is possible to cut fifty or a hundred sections of almost any tissue and give one to each member of a class, each student receiving a fairly typical section, sufficient to demonstrate the various points described; but if we

were restricted to a point in one section, as occurs when a photograph is indicated, there might not occur a single specimen in these sections that would be entirely satisfactory. Hence I had to exercise much more care in the selection of the slide than in anything else, and in some instances to delay a considerable time before I obtained a sufficiently good section to make a diagram. In other cases I found a special process useful in more closely imitating the colors of the stained sections which I shall now briefly describe.

During the early part of 1889 I was shown some beautiful photographs on Liesegang's aristotype paper of the spinal cord taken by Dr. Ringrose Atkins, of Waterford. They were of such a brilliant tint as to give a very correct idea of the original specimens when treated by some staining agent. Some correspondence ensued between us, in which he very kindly explained the process he had adopted. I made a few modifications in the process, adapting it specially for lantern slides, and then found that the process could be extended into other colors.

Dr. Atkins' process consisted in toning the silver image with ferrocyanide of uranium. The completed slide, well washed in alum to remove the sodium thiosulphate from the gelatine, was placed in a bath composed of equal parts of a one or two per cent. solution of potassium ferridcyanide ($K_6 Fe_2 CN_{12}$) and a 6-per-cent. solution of uranium nitrate.

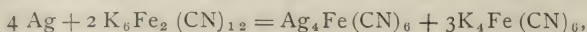
According to the length of time the plate is immersed the tone passes from a brown to a red. This method is very useful for some shades, giving a slightly opaque red. The process would appear to be, that silver and potassium ferrocyanides are formed and the latter is subsequently decomposed, forming uranium ferrocyanide, the silver salt remaining and giving rise to the opacity mentioned. At this stage the color can be very much heightened and rendered more transparent by placing the slide in sodium thiosulphate, which dissolves the silver salt and leaves an image formed solely of uranium ferrocyanide. The shade thus obtained strongly resembles that of insects ordinarily prepared for microscopic examination, and those who have occasion to photograph these will find this method of transparency staining of considerable utility. It must be remembered that no process is universally applicable, and that it requires a little care to use either method according to the particular shade of the object photographed. In a specimen of the cerebellum stained with santal wood I have been able to copy the shade of the original almost exactly, while it is an approximation to the color of picro-carmin and carmine, although hardly so red.

The next step was an easy one. Given that the action of a 2-per-cent. solution of potassium ferricyanide ($K_6 Fe_2 CN_{12}$) is to form a pale whitish image of silver ferrocyanide, then let the plate be well washed to remove the free ferrocyanide from the gelatine, and afterwards flood it with a solution of ferric chloride. The image will turn to an opaque blue which can be rendered transparent if the silver chloride is dissolved out in sodium thiosulphate. This latter method gives an image in Prussian blue, but the method is more easily worked for lantern slides than any hitherto described; the other methods, such as that of Benecke, of St. Louis (quoted in Anthony's BULLETIN), require long exposure in sunlight.

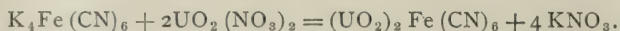
These last methods are particularly applicable to tissues, such as the central nervous system, which are generally stained by diffuse protoplasmic stains like carmine or soluble aniline blue. For the latter, the blue method is an exact

imitation. By stopping out different parts of the negative I have been able to combine both colors—obtain, as it would appear, a double-stained slide. The trouble, however, is considerable, and the number of specimens to which it appears applicable are few. Although I have been able by modifications of the method to obtain a three-colored slide, I cannot at present recommend it to you to copy.

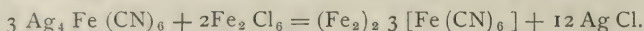
The chemical changes involved in these processes are probably something of the following nature: The potassium ferricyanide is reduced by the free silver in the plate, silver and potassium ferrocyanides being formed, thus:



the potassium ferrocyanide then forming uranyl-ferrocyanide by double decomposition:



In the blue process, the silver ferrocyanide being alone left in the film by the prolonged washing, reacts with the ferric chloride, forming Prussian blue.



These reactions have been repeated by ordinary chemical methods by Professor Lapper and myself in the laboratories of the Royal College of Surgeons of Ireland, and have been found to agree with those observed in the gelatine film.

I may mention for the benefit of any who may wish to use these methods a few facts which I have observed during my experiments.

In order to avoid staining the plate it is advisable to use the toning solution fresh. Although the solution will act a second time, the second plate in my hands always has had a yellow tone where it should be colorless. This yellow color can be removed by dilute alkalies, but at the risk of unnecessarily reducing the picture in color.

If the color is not satisfactory after the plate is washed, it can in white light be put into some alkaline developer. I found hydrokinone and potassium carbonate satisfactory. By this means the uranium will be removed and the ferrocyanide of silver reduced to its original condition, or with very little noticeable change. The toning process can be repeated or modified.

It is also requisite to avoid any traces of sodium thiosulphate or developer in the film, because they are all active reducing agents, and staining will be sure to follow.

As a saturated solution of alum appears to have no deleterious effect on the uranium color, it can be used with advantage after washing to remove any traces of the above reducing agents. This it appears to perfectly accomplish.

A MIDSUMMER FLASH.

BY MISS ADELAIDE SKEEL.

Not a fire-fly, nor a streak of lightning, nor a safety match, but a non-explosive cartridge, and the story is more about the impression made off the plate than the image on it. I develop my pictures in a one-roomed, disused cottage half a mile away from our house, near a brook which gives me frilling cold water and surrounded by tall maple trees whose heavy foliage shade my north window so completely that one thickness of yellow fabric is more than a sufficient covering for the small, dusty panes. The Irish farm laborers call it

"Miss Betty's dark house," believing that I run a whisky still, since no one is allowed to step foot within its damp precincts. Knowing that chemicals should be kept in the dark, I rarely throw open my door or window, even for house-cleaning research, hence it is currently said that Charley Ross, the Ten Tribes, Stanley—before he was found and married—and other lost articles might be discovered if I would allow the public to visit me. I prefer, however, to work behind closed doors, thinking one suffers enough during the exposure to excuse secrecy in the development, for certainly it is irritating to be asked if one is not warm under a focusing cloth, why the landscape is upside down on the ground-glass, to have enthusiasm scorned and fatigue over-pitied, methods of work criticised and advice given gratis, questions put about the cost of the outfit and the formula of the developer at a moment when the closest attention should be given to the subject in hand. I endure all this, because I must, but when it comes to the development I shut the door. Mine is rather a gloomy retreat, in a quiet, lonesome lane; yet within its moist fastnesses, alone with the latent image, I have the most exalted moments of happiness and hope. I have, alas! no stock-house contrivances, only a bare pine table, a few meat platters filched from the kitchen, a tin jar for waste water, a china pitcher for fresh, a one-solution developer (advanced amateurs excuse!), a hypo dish separated from all possible contamination by being placed on the floor in a distant corner of the room, and such odds and ends of broken farm tools as are stored here because no one knows where else to put them. By and by, when I can get a picture of baby with less than two heads, a good portrait of my grandmother knitting, or a fair copy of some rare family miniatures, I am promised that my den shall be shelved and tinted, that water shall be brought through pipes from the brook, and that I shall have *carte blanche* to order anything I like from 591 Broadway; but at present I am working out my own salvation, or the reverse, and it was this primitive interior that I flashed one cold, rainy midsummer day. My excuse was that I wanted to take something, and this was the only thing I could take in the rain without getting wet. I spent but little time in arranging my utensils artistically, partly because I wished a realistic picture and partly because I disliked moving old rakes, broken scythes and empty barrels in the dark. At the last moment, when my detective was screwed on, my tripod and stud just within the porch, its focusing needle set at the shortest distance, I remembered my flash-powder was half a mile away at the house, stored in my top bureau drawer for dryness and safety, but I took the long trudge after it cheerfully, never pausing a moment as I passed the parlor door to hear the knitting, novel-reading, stocking-mending members of my family say:

"Betty, you will take cold;" or

"Stop a minute, Mrs. Clover wants to ask you about her picture;" or

"Have you on your rubbers? Be careful not to set fire to anything."

On reaching my dark cottage again what was my surprise to find seated on the roofless porch a woman, a baby, a monkey and a hand-organ! With better lighting they would not have made a bad group, but under the present circumstances I felt their room to be better than their company, and this I endeavored to say, politely:

"Nobody lives here," I began, trying to make my way past these uninvited guests, "and I must really ask you to go on."

Then, succeeding in opening the door and squeezing myself in, so I might

address the company from a secure vantage-ground, I was surprised into farther retreat by the advance movement of the monkey, who followed me as far as his chain would permit, and was himself followed by mother and child. Scarcely noticing damp or darkness, but dully seating herself on a reversed wheelbarrow, she explained her intrusion with abrupt simplicity :

"He has been gone since last night, and is after leaving me with the baste, and the child, and the organ, which he do turn so sweetly when it isn't in liquor that he is. It's the bad boys that have got the hold of him, so it is, Miss ; but if I may bide in this shed till the storm is after, I will not trouble you no more."

What could I do? What would an experienced philanthropist have done? I had no relief-tickets, no work to give, nothing but poisons for meat and drink. I certainly did not like having a baby and a monkey let loose upon me in the dark ; yet it was raining hard, and rain in the country does wet one so. I was a trifle less afraid to stay with the poor creatures than to leave them to their own destruction among my acids and alkalies, so after a moment's hesitation I said with forced cordiality :

"Stay where you are, till the storm is over, but don't touch anything ;" and then, to escape the burden of sustaining a one-sided conversation—for country poor are less interestingly communicative than city arabs—I busied myself laying everything in train for my flash, of course making sure the callers were not within the lens's angle of vision. This done, I waited, and waited, and waited, for the clouds to roll by, and my guests to leave ; but when, after ten or fifteen minutes, it still continued to pour, tired of being a prisoner, I decided to make the explosion.

"Don't be afraid," I said ; "there will be no noise, only a sudden light. Shield the baby's eyes and hold the monkey still."

"Will it harm the organ, Miss?" asked the woman, throwing a ragged shawl over the instrument as carefully as she would have covered her baby or I my camera. "He said to be precious tender of it, and he do play so sweetly when it's not in liquor that he is. Sure and he'll be that pleased when he comes back and finds us dry and safe, me and the child and the baste—whist, be still, you heathen"—this last evidently to the monkey, whose restlessness was leading him to clank his chain and be impatient to get away from the dark dampness and evil-smelling atmosphere of my room.

Making no reply, I struck a match, and in a moment the blinding blaze came, but instead of being followed as I expected by cries from the baby, squeals from the monkey and invocations to the holy saints from the woman, a deep-chested man's voice resounded from a not too distant corner near my hypo-pan, I think, and the words I heard were :

"Faith ! and is it the Judgment Day just that is come to me? Now all ye devils defend me if ever I touch a drop of the critter again ! Sure, and it's an awakening from the dead that I have had ! Like and I'll find hell handy waiting at the door for me, if I don't get out of this when I lay me down to rest a minute fornenst I came back to Nora and the brat !"

Faith, and I did not wait to see a reunion of a happy family, nor to speculate how long I had unwittingly given shelter to a drunken tramp ; but escaping umbrella-less, breathless, hatless, into the storm, pushed past mother, child and monkey into the leafy lane, nor did I tarry there, but made the best, or rather

the worst of my way through pools and mire up to the homestead piazza, where I told my blood-curdling tale. Here I was by turn laughed at, pitied, disbelieved, till finally the whole family, with several visiting neighbors, sallied forth to inspect the scene of my adventure. For once, I cheerfully threw wide door and window; I allowed candles to be lighted; I invited examination of every nook and corner. I allowed Mrs. Clover to step in the hypo-pan and let my father trundle out a wheelbarrow filled with spoiled negatives, but nothing was found to prove that my fright was other than a bad dream. Finally, laying aside every previous prejudice, I asked the company to see me develop the plate, hoping an outline of the man would show up; but although I used every bit of solution in my bottle, nothing whatever appeared on its gelatine film but dense fog.

Disappointed and baffled, I turned again to my audience to explain my failure as scientifically as possible, when one of my sisters relieved me by stooping down and picking from the damp floor under my table the slide which I had flung there in my hasty flight, and on top of it a dusty red cloth jacket such as are worn by organ men's monkeys, and by them alone.

"There certainly was a monkey here," she said, "and for the rest we must take Betty's word, since we can't have photographic evidence."

As she spoke, evidence not distinctly photographic and quite off the plate—which I had fogged by forgetting to replace the slide—came to our ears, for close by, in the lane, we heard a baby cry, a woman scold, a man answer back in a voice not sweetened by whisky, and, above all, the strains of a hand organ grinding "McGinty's at the Bottom of the Sea."

REPORT OF COMMITTEE ON DAGUERRE MEMORIAL.

AFTER working for 365 days you do not expect much of a report. You are probably all aware that the Boston Convention of this Association passed a resolution to erect a memorial to Daguerre; also that a committee be appointed, consisting of the Executive Committee of last year, to erect a memorial and have it in place at this Convention. That committee have tried to fulfill their duty to the best of their ability, and although some have thought they could have done better, we have done the best we possibly could.

I will make a short report of our work and the financial report, and you can judge if the committee and members of the Association have both done their duty.

After leaving Boston last year I was in New York about a week, and thought while there I would look after something with respect to the erection of this memorial. After inquiring in several places about sculptors (many were spoken of) I saw Mr. Hartley, who was recommended highly, and I inquired as to the possibility of erecting a memorial in one year, of any description—granite, bronze, etc. He said it was possible. I told him that after I went home we would think the matter over and find out just how long it would take to erect it.

After returning home I found letters on my desk making inquiries about this memorial. In answer, I said the committee had not made any arrangements as to whether it would be given to one person or to many. Letters began to pour in from all over the country, sending proofs of every description. Among others was Mr. Hartley's, and as his were the only ones that would do, we looked at them more than the others. I have the original sketches which we received from Mr. Hartley. We have been told that an unfinished print or sketch of this memorial should never have been sent out, and we replied that we never could get a sketch of anything until it was corrected; we could simply get the idea as Mr. Hartley gave it to us, and then leave it in the hands of a competent man to

carry out the idea. We must have a model made, and have it ready so that the committee could see it at their meeting in January, and so that the memorial could be finished for this Convention.

We did not choose; we told Mr. Hartley to make a model of two different ones. He did so. The committee met at his studio about the middle of January and discussed the whole matter. President Appleton and Vice-President Hastings made a good many recommendations as to changes, which were made. Mr. Appleton suggested then that to reach all the members of the Association, amateurs and men connected with photography, a check book, each book to contain one hundred checks, should be obtained, and sent to all photographic dealers and manufacturers throughout the country. I got up eighty of these books, and if they had all been filled we would have made \$8,000 of \$1 each. We supposed that we could make the sum of \$6,000 to \$10,000. One gentleman thought \$20,000 could be raised easily enough. But for some unknown cause it failed. Our Western journals poured cold water upon us, and the people became indifferent to it. The Eastern journals supported us to a man—why, I do not know—and especially the *Photographic Times*, which has raised the largest amount of any. Mr. Adams has worked nobly. There are about eight journals, and if every one had done as well as he has the result would have been different.

In addition to this, we thought to reach all those parties who had made fortunes through photography. Some of the New York illustrated papers had agreed to contribute their mite in pushing the project forward, as well as money, of \$200 or \$300 each. But when asked for the contribution we were asked how many of our wealthy men had contributed. We had no answer. In order to reach all of those parties who are indirectly interested in photographic publishing, manufacturing, etc., we appointed six committees—one in Washington, one in New York, one in Philadelphia, one in Boston, one in Chicago and one in St. Louis, asking them to meet and do all that they could with the wealthy photographers. All of them seemed to say that they were going to do all they could, with the exception of one in St. Louis. When they went to work to try to do what they could, they said every one told them it was a humbug, a monstrosity, etc. It killed the collecting of money almost entirely. (A list of contributors was then read.)

Especial attention is called to the name of E. K. Talcott, a young lady in Boston attending her first convention, who raised among her friends \$30.

The collections made at Boston last year were received by the Secretary, Mr. O. P. Scott, who said he had sent them to Buffalo, and that he would contribute \$10 more to the amount.

This is our report. You must judge for yourselves who have done their duty.
Respectfully submitted.

Signed by the Committee.

THE UNVEILING OF THE DAGUERRE MONUMENT AT WASHINGTON.

AT 3 P.M., August 15, 1890, the unveiling of the statue of Daguerre took place in the rotunda of the National Museum at Washington, D. C., in the presence of the members of the Association and many others.

Mr. McMichael, of Buffalo, Chairman of the Memorial Committee, spoke as follows:

Mr. President, Ladies and Gentlemen: Although it may seem extravagant appreciation of the man to whose memory we here to-day offer lasting and substantial tribute, I trust I do not misrepresent the voice of this Association when I say it is one of the most significant events that have ever happened in this American Capital. An organization conceived and consolidated as this one was—the Photographers' Association of America—to carry to the highest perfection this signal discovery of the great Frenchman who surrendered its possibilities to all mankind without the inventor's usual reward, could not do a more honorable or grateful act than to erect a fitting monument to Daguerre in this

Western World. Moreover, as Americans, we must say that we are the first nation aside from France to remember in monumental art what Daguerre has done for mankind, and in no more fitting position could our memorial be placed than in the National Museum of the Union.

Inspired by the thought that this body, as only an inconsiderable fraction of the hundreds of thousands now engaged in various phases of the photographic art all over the globe, might erect in suitable form an enduring monument to the founder of our craft and our profession, this Association at its last annual convention ordered such a work to be executed. The committee charged with the carrying out of this task, after consulting various proposed forms of expression, decided to accept the ideas of the celebrated sculptor, Mr. J. Scott Hartley, of New York, whose design as afterwards approved was at once unique in conception, comprehensive in its thorough application to the subject, and entirely out of the commonplace or conventional. It was considered that the tribute, while losing nothing by dignity or elevation of sentiment, must present a simplicity in keeping with the camera, which, while one of the three greatest inventions of modern times, has likewise become the most universal over the earth, by the very reason of its primitive character and processes of manipulation. Do we not see travelers coming home, day by day, from the remotest lands of barbarism—Stanley from the Dark Continent, Kennan from the dungeons of Siberia, Prejerslsky from Central Asia, and Nordenskiöld from the Arctic Seas—with those mysterious regions laid before us in startling quality and realism, all because of the instantaneous victory of the camera, a triumph over complicated action as well as the reposeful spirit of the landscape. Nor should we forget right here in this acreage that surrounds us, where scientific expeditions have for generations been equipped to survey the unknown wilderness of this continent, that the camera has been the head-light of science—that it has explored the secrets of the moon, the constellations, the planetary systems, and has been likewise a potent weapon of the army and navy of the United States. To pursue an inquiry of its manifold usefulness, as in the work-shop and factory, in the arts of painting and sculpture as well, is useless in such an assemblage as this. To the newspaper and the courts, and the surgeon, it has been a powerful and useful weapon. Again we ask how many of the hundreds of thousands of inventions recorded in yonder Patent Office, many of them now dominant in every country of the earth, would have been possible, had it not been for this discovery of Daguerre, a half a century ago. But perhaps one of the greatest features of this discovery is the light and happiness it has carried to the millions of people dwelling between the poles. Portraiture in oil, black and white and pastel was an expensive and luxurious enjoyment fifty years ago, but when the discovery of Daguerre broke out like a universal epidemic over the world, the humblest could preserve the forms, faces and characteristics of loved ones gone before. If human kind be here considered, may I not ask, Is this not better than steam by land or sea, electricity, or dynamite projectiles?

I know, therefore, that we can all appreciate the story told by this memorial now submitted to the American people. The bronze figure "Fame," in reverential pose, places the laurel wreath about the head of Daguerre, and it extends around the earth, thus typifying the universal blessings conferred by the great Frenchman; and the pedestal is a granite Atlas, on which we may believe this artistic and eloquent composition will rest for ages yet to come.

This committee has endeavored to discharge its duties to this Association, to this assemblage and to the Government of the United States, to which it commits the keeping of this memorial to Daguerre now to be unveiled.

Mr. McMichael then introduced Secretary Noble, who unveiled the statue and delivered the address of the occasion.

Mr. Noble spoke as follows:

Fame enwreaths the globe with the glory of Daguerre. His name might be properly inscribed upon the figure of the sun. With its divine light his name will evermore be associated; with its brightness his genius will be illumined for all time. The earth and the firmament show forth the handiwork of the great

Creator, but their most hidden forms have been and are yet to be developed by that art the secret of which God gave Daguerre.

The claims of the other great searchers after truth in this art, their labors and their attainments, are not to be disputed. There are Scheele, Wedgwood, Seebeck, Talbot, and Daguerre's associate co-inventor and compeer, Niepce. But it was for the scenic artist of the Parisian opera, first securing through the lens the image on the plate, to have fixed it there and produced the daguerreotype. Daguerre did not claim the invention as solely his. At the very culmination of his fame he shared the pension of France in due proportion with the son of Niepce. For the discovery of photography Daguerre was awarded a pension of six thousand francs, and Niepce four thousand. Yet the complete and practical invention was the result of long months of toil in the laboratory by Daguerre after his copartnership had begun, until his all-absorbing devotion to his art and his emphatic expression of his hope "to fix the shadow on the wall" had led even his relatives to fear he was indeed at last insane. But while his physician was thinking of a certificate that might consign this devotee to a mad-house he came forth with the amazing truth of his success.

Daguerre not only found the secret of picturing material forms upon the plate and of fixing them there, but he gave the knowledge and process of the art to mankind. Upon the declaration from the Academy of his discovery, the soul of the people responded as it ever does to the benefactor of our common race. Here was no alchemist seeking to create gold, and hiding each supposed newly discovered fact in chemistry in his avaricious mind; but an unassuming laborer among his fellows holding high his sunlit torch of truth: he reached that elevation where knowledge produces wealth indeed, but where sympathy for man secures renown.

It is most appropriate to have placed at the Capital of our Republic to-day a monument of one who commenced his career as an artist, in very truth, at the foot of the ladder; who obtained means of testing his already conceived invention by exhibiting the first fruits of his search—the diorama—and amid the most marked characteristics of his genius was an unfailing reliance on his own industry. In our country the lesson cannot be too frequently taught, that for intelligence and industry the way to success and distinction is ever open. The Republic knows no class, and even as the sunlight enveloping the globe vivifies and beautifies all that seeks its light, so does liberty embrace, sustain and reward the souls of all that aspire and work. The American Association of Photographers may proudly place at our National Capital the statue of this founder of the art it cherishes, whose life and success illustrated anew the dignity of labor.

It may be said by some that if Daguerre had never lived photography would yet have existed; that in the fervent heat of intellectual effort of the nineteenth century many minds were intent upon the discovery of this single art, and had he not succeeded, others would.

There is a pathetic story told by Gaston Tissandier. I tell the story in substance as it is told by him, of a youth poorly dressed, timid, miserable and famished-looking, who entered the shop of Chevalier, an optician, the most celebrated in Paris. This youth approached Chevalier, and observing the work going on, the boy said: "You are making a camera in which the ordinary lens is replaced by a convergent glass. What is the price?" Upon being told this he seemed sadly discouraged, but the conversation continuing, he said: "I have succeeded in fixing the image of the camera upon paper." He produced a box, evidently of his own workmanship, furnished with an object glass, and said: "By this I can obtain views from my window. I wish to procure your improved camera in order to continue my efforts with a more powerful and certain apparatus." Chevalier silently contemplated him as another enthusiast seeking the shadow already deluding, as he believed, Niepce and Daguerre. Finally the boy drew from his pocketbook, devoid of aught else, "not a drawing nor a painting, but an image of the roof, the chimneys far-stretching away, and the dome of the Pantheon from his garret window. He had fixed a view of Paris and had it there to show." But this youth was allowed to go on his way

with his picture and his poverty and was heard of no more. So ends the story. He sank in the great ocean of humanity where many another genius has gone down unrevealed, unrecognized, and fameless. "Gems of purest ray, serene," that "the deep, unfathomed depths" of this ocean bear.

Many sailed, but Columbus discovered. The continent is his who first erects his standard and invites all people to its shore. Such was Daguerre. It may be another discovered, but Daguerre both discovered and made known. But why speak only of the earliest discovery? Let us look for a moment upon the wonders of the art thus developed. Photography in Daguerre's time took from three to seven hours to develop the picture after it had been taken. To-day it is the operation of a moment. Then the subject of the photograph had to be held in view for such a time that the process became torture, and caused many a negative to be too much exposed or badly developed, a result seen sometimes now outside the product of the camera.

To-day the movements of the fleetest horse are caught as if he were suspended in the air. Wheels of the swiftest locomotive are so instantly impressed that the spokes in the driving-wheels of a forty-mile train appear the same as if at rest. The bird in its flight is pictured with the shot that are rushing to overtake it. The lightning's flash is caught, and the dropping rain presented with it and by its light. The telescope has, indeed, revealed many secrets of the sky, but with the mightiest telescope that man has ever made there is not presented to the human eye worlds that through it are depicted upon the plate of the photograph, and thus, and thus only, transmitted to human intelligence.

May it not be, is it not already, true that the photograph is heralding the approach to human intelligence of the light of long-existing suns? The entire newspapers issued each day in a beleaguered city have been condensed and transmitted beyond its walls by a swift pigeon and then enlarged and read by all the world. It is asserted that a new color has been added to the rainbow, and it is anticipated that extinguished stars now rolling in almost complete darkness may yet be photographed. All the beautiful productions of art-science the world possesses are brought to the household, until the child in the nursery prattles of the Venus of Milo, and the young machinist may study the most immense and wonderful engineering in his home. Photography has placed a magic mirror in every one's hand, in which he may possess and enjoy the wealth, the only real wealth, of all humanity—the best products of the best minds. It is not necessary to endeavor to enumerate to you all the wonders of photography, but there is one process should not go unmentioned here: the composite photograph, where many of a class—it may be of school-girls at Vassar or boys at Yale—are photographed one after another upon the same plate, until there is at last presented a resultant of them all. A common type comes forth bearing their combined characteristics, the average of their human forms and faces—majesty and strength in man, beauty and versatility in woman. The most remarkable of these narrated is the composite of the pictures of Washington. Many artists in their day and opportunity made pictures, each of the beloved Father of Our Country. If a composite is taken of those that were in profile, one result appears, but unsatisfactory. With those of full face, there is another result, still unsatisfactory. But taking the combination of pictures, busts or medallions of all the Washingtons that all the artists have made, a face and a form is displayed whose lineaments are such that they may be accepted as truly those of Washington.

May this not suggest to devout minds even a higher conception: that were all the features of all the human faces that God has portrayed successfully combined upon the photograph, we might have therefrom produced the true features of the Saviour, the perfect flower of all humanity?

No art has engaged from the first the attention of the greatest inventors besides those pursuing it directly. Watts, the inventor of the steam engine; Davy, who found a means to deprive the damp of the mine of its explosive dangers; Herschel, who by his inventions discovered new worlds in the skies, were all co-laborers in the art of Daguerre.

Gentlemen, your art has become the art preservative, the art commemorative, of all the arts. Even as the eye receives the forms of matter upon the retina, and prints them upon the memory, the photographic album of the soul, so does your art secure and preserve all forms of nature—the products of the sculptor, the painter, and even of the printer—by photography.

The art of photography is in its infancy. Its greatest wonders have not yet been attained. The servitors at this altar, unlike the followers of Zoroaster, are not worshipers of light alone, but of all that light may reveal in nature and in science.

The Association may be congratulated upon the selection it made of Mr. Hartley as its artist to formulate artistically a monument for the great French inventor of its art. An already well established reputation of the sculptor has been much enhanced by this beautifully symbolic representation.

Americans have not been unfaithful stewards of the talent intrusted them by France. The improvement to its present wonderful stage of advancement and the enhancement of the commercial value of photography has been in great part the result of the activity of our native inventors. They have improved the camera, the shutters, and especially the sensitive films or surfaces.

As the Secretary of that department of which the Patent Office is the most valuable and advancing portion, I thought it but my duty, however feebly, to meet you and to aid you: you are bees of this hive, and your king will be he who does the most for the art of Daguerre.

But, gentlemen, your art, that in some sense may be deemed to have rivaled nature's own lenses, cameras and tablets, cannot hope to reach, as some have vainly thought, to the spiritual world, the realm of spirit. You may depict the homestead, but who will print the happy memories of childhood, the affection of parents, the hopes of youth, the aspirations of manhood, the belief in God, and the fraternity of man? These are printed on the mind by the Great Photographer of the soul, that when the stars shall fade away, the sun himself grow dim with age, and nature sink in years, shall flourish in immortal youth, unhurt amid the war of elements, the wreck of matter and crash of worlds.

May we all take care not only of success on earth, but that the form we are imprinting on the great hereafter will unite these with the great souls who have deserved their highest reward by living for the good of men.

Ex-Governor Fletcher, of Missouri, was invited to the platform, and he addressed the audience in a short but brilliant manner, concluding with words of congratulation and compliment to the men who composed the Photographers' Association.



ON THE REVERSAL OF THE NEGATIVE PHOTOGRAPHIC IMAGE BY THIO-CARBAMIDES.

By COLONEL J. WATERHOUSE, B.Sc., *Assistant Surveyor-General of India.*

IN the early part of last month, while carrying out some experiments to find a preservative for eikonogen, I discovered that phenyl-thio carbamide (phenyl-sulph-urea), added in a very minute quantity to the ordinary eikonogen developer, possessed the remarkable property of more or less completely transforming the negative photographic image into a positive, and that thus I was able to produce at will more or less perfect positive pictures in place of negative ones under otherwise quite normal conditions of exposure in the camera and of development.

Later experiments have shown that allyl-thio-carbamide, or thio-sinamine, possesses the same property, perhaps in a stronger degree, and reverses the images developed with pyrogallol and hydroquinone, as also those developed with eikonogen. Thio-carbamide, or sulph-urea, also produces reversal with the eikonogen developer, but not so markedly as the two alcoholic thio carbamides. Carbamide, or urea, appears to cause no reversal with the eikonogen

developer ; and this observation, if confirmed by further investigation with other developers, would tend to show that sulphur has an active part in bringing about the reversal.

I have also found that the phenyl and allyl-thio-carbamides, when applied to precipitated bromide or chloride of silver, or to gelatine dry-plate films containing them, have no visible action upon them ; but, if an alkali be added, a powerful darkening and reducing action is set up, even in the dark and entirely without the action of light. With the iodide this action is not so strong.

Thio-carbamide with alkali gives off ammonia and darkens and reduces the silver haloids ; and a strong solution of it is capable of darkening a gelatine plate in the dark even without alkali.

Urea, even with alkali, does not visibly darken a gelatine dry-plate film, nor darken or reduce the silver haloids in the absence of light.

So far as I can ascertain, these peculiar actions of the thio-carbamides, in reversing the photographic image and in darkening and reducing the silver haloids in the absence of light, have not before been noticed.

The thio-carbamides of the alcoholic series are formed by the action of ammonia on the so-called "mustard oils," or thio-carbamides. Phenyl-thio-carbamide, formed from phenylic mustard oil, has, according to Watts, the formula $CS < \begin{smallmatrix} NH \\ NH_2 \end{smallmatrix} C_6H_5$

It is a crystalline substance, very slightly soluble in cold, more easily in boiling water and in alcohol. Watts further remarks that, when boiled with nitrate of silver, it exchanges its sulphur for oxygen and is converted into phenyl-carbamide.

Applied by itself in solution to an ordinary gelatine dry plate containing bromide or bromo-iodide of silver, it has no visible reducing action, and, indeed, appears to act as a restrainer of development ; but mixed with an alkali, such as sodium or potassium carbonate, it very powerfully darkens the film, even without the action of light. When fixed, the darkened part of the plate is of a deep yellowish olive color, and is harder and less absorbent of water than the unaltered part of the film. The darkening action is the same on a gelatino-chloride of silver film, though I have not succeeded in obtaining the reversal of the image on chloride films developed with eikonogen as noted below.

The alkaline solution of this thio-carbamide also darkens and reduces pure bromide of silver in the dark ; and if the darkened precipitate be treated with nitric acid, it clears in color, and by the addition of muriatic acid to the clear fluid chloride of silver will be precipitated. Eikonogen developer added to the darkened precipitate blackens it, and if, after washing the latter, nitric acid be added, only a very little unaltered bromide is left together with a flocculent brown insoluble deposit.

Weak solutions of phenyl-thio-carbamide act more effectively in reversing the image than strong ones, and with the eikonogen developer the best proportion seems to be about 20 to 25 parts of the watery saturated solution in 100 parts of the mixed developer ; and as a saturated solution in water, even at the comparatively high temperature we now have in Calcutta, seems to hold an almost inappreciable quantity of the salt, the proportion actually contained in the developer must be exceedingly small.

The eikonogen developer I have usually employed is that recommended by Dr. Nicol, and contains sulphite of soda—

A.	
Eikonogen.....	5 parts.
Sodium sulphite.....	10 “
Water.....	100 “

B.	
Sodium carbonate (cryst.).....	8 parts.
Water.....	100 “

One part each of A and B to two parts of water.

I have not found that the presence of sulphite interferes, as might have been expected, with the reversal, and am inclined to think that its presence in moderate quantity is beneficial, though good reversals may be obtained with plain eikonogen and carbonate of soda.

The addition of a small quantity of potassium bromide (from 0.5 to 1 part of a 10-per-cent. solution to about 100 of developer) seems to aid in the reversal of the lights. In some cases a trace of ammonia also seems to be beneficial in aiding the complete reversal.

So far, I have not found phenyl-thio-carbamide to have the same action of reversing the image when used with the ferrous oxalate, pyrogallol, or hydroquinone developers as it has with eikonogen. With ferrous oxalate I have obtained traces of reversal. Applied in different strengths to an exposed dry bromide plate and developed with pyrogallol (Britannia formula), it acted as a powerful restrainer. It did so also with ordinary pyro-ammonia and bromide, and stained the plates a deep yellow. With the hydroquinone developer its action was quite different, and it appeared to be a powerful accelerator, reduction taking place over the touched parts, which in fact were fogged all over before the normal image was developed. No signs of reversal were obtained with this developer, but it is probable that with further investigation it will be found to reverse, as it does with thio-sinamine.

It may be here noted that different makes of plates show different capabilities of reversal, and, so far as my experiments have gone, Wratten's "Ordinary" and "Instantaneous" plates have given the best results; but possibly variations in the quantity of thio-carbamide and of bromide will have to be made for different makes of plates.

Apropos of this, I may remark that, now that dry plates are so invaluable and so largely used for scientific researches of all kinds, it would be a great convenience, at any rate to distant workers, if dry-plate makers could indicate on their dry plate packages the nature and proportions of the haloid salts used in the emulsion.

Thio-sinamine, or allyl-thio-carbamide, according to Watts, has the formula $\text{CS} < \begin{smallmatrix} \text{NH} \\ \text{NH}_2 \end{smallmatrix} \text{C}_3 \text{H}_5$ and is prepared by treating allyl-thio-carbamide, or the essential oil of black mustard, with ammonia. It is more soluble in cold water than the phenyl-thio-carbamide, and is also soluble in alcohol. In some of my experiments I have used an almost saturated solution of the thio-carbamide formed by adding four parts of the strongest liquid ammonia to one part of the ordinary essential oil of mustard obtained from the druggist. As soon as the ammonia has taken up as much of the oil as it will, the solution may be decanted

off and the ammonia allowed to evaporate. Of the solution thus prepared about one part in 100 of the mixed eikonogen developer as above is sufficient to produce reversal on development; a little bromide may be added, and a slight trace of ammonia seems beneficial.

This solution has rather an unpleasantly strong smell of old cheese and garlic, and it is advisable to evaporate it and obtain the thio-sinamine in a crystalline and odorless form, in which it may also be purchased in Europe. Of the saturated solution of the crystals from one-half to one part in 100 parts of the developer is enough.

The reversing action of the thio-sinamine seems to be stronger than with the phenyl-thio-carbamide, and it gives clearer whites. The color of the images produced with it with eikonogen alone, without bromide or ammonia, is a beautiful rich chocolate brown verging to purple. It has given a very fair reversal with pyrogallol developer containing sulphite, though it did not do so with a pyro-ammonia developer prepared according to the Britannia formula with nitric acid and a considerable quantity of bromide. With Thomas' hydroquinone developer it also did not reverse the image, but with a developer prepared with—

Hydroquinone.....	1 part
Sodium sulphite.....	2 parts
Carbonate of soda (cryst.).....	10 "
Water.....	70 "

I obtained very clear reversals in copying, though I was not so successful in a landscape with considerable contrast between the sky and foreground. With eikonogen also, the thio-sinamine seems to work best with sulphite.

Applied to pure precipitated bromide of silver, in the dark thio-sinamine does not darken it, but seems to enter into combination with it, forming a soft pasty mass, and, if in sufficient quantity, dissolves it. Carbonate of soda solution darkens the soft mass at once, and the solution treated with dilute muriatic acid gives off a smell of sulphuretted hydrogen; nitric acid partly and slowly restores the color. With muriatic acid the nitric acid solution gives chloride of silver. A very peculiar smell was evolved by the mixed acids. Eikonogen developer added to the darkened precipitate after treatment with soda turned it quite black. Nitric acid caused effervescence, and made the precipitate lighter in color. It appeared to be a mixture of yellow bromide and a black substance with a little flocculent deposit. Muriatic acid added to the nitric acid solution gave a copious precipitate of silver chloride.

The alkaline solution applied to chloride of silver also darkens it very strongly. Nitric acid does not clear the precipitate much, but the solution gave a copious precipitate of chloride with muriatic acid. The action generally is much the same as with the bromide.

With silver iodide, thio-sinamine also forms a soft waxy mass, and dissolves it. Carbonate of soda only very slightly discolors the mass, with the dirty yellow appearance of a sulphur compound of silver. Nitric acid set up a strong effervescence and nitrous fumes and restored the iodide to its original color. The acid solution gave no precipitate with muriatic acid, but the same peculiar smell as above.

These compounds of thio-sinamine with the haloid salts of silver seem very curious, and might be worth investigation by a more experienced chemist.

Thio-carbamide, or sulph-urea, $\text{CS} \begin{smallmatrix} \text{NH} \\ \text{NH}_2 \end{smallmatrix}$, which may be prepared by heating well-dried sulpho-cyanate of ammonium in a flask in an oil bath for two hours at a temperature of 170°C . (338°F .), forms long silky needles which are very soluble in water. Its reactions with the silver haloids are peculiar, and somewhat resemble those of thio-sinamine.

With silver bromide it sets into a pasty mass, and does not discolor it. Carbonate of soda added liberates ammonia, darkens the bromide, and from the smell, some sulphide of ammonium seems to be formed. Muriatic acid precipitates chloride with the nitric acid solution. Eikonogen developer blackens the bromide darkened with soda. The black precipitate is only partially soluble in nitric acid, and the clear solution gives chloride with muriatic acid.

With silver chloride it also forms a pasty mass, and there is the same evolution of ammonia and darkening with soda; a metallic deposit of a yellow color is sometimes deposited on the glass vessel. Weak nitric acid has little action, but strong acid causes brisk effervescence and evolution of nitrous fumes, but does not readily dissolve the precipitate on the glass, nor entirely restore the white color of the chloride. Muriatic acid added to the nitric acid solution precipitates chloride. Eikonogen developer blackens the darkened deposit at once. Nitric acid causes great effervescence with nitrous fumes, partially restores white chloride; the solution precipitates chloride with muriatic acid.

With silver iodide, thio-carbamide also sets in a pasty mass, which does not darken alone. Carbonate of soda gives off ammonia, but does not darken the iodide so strongly as the bromide and chloride, nor is any mirror formed on the glass. Nitric acid removes the darkened coat, but muriatic acid produces very little chloride with the acid solution.

Eikonogen does not blacken or darken the alkaline precipitate much. Nitric acid clears the iodide, but the solution gives but little chloride with muriatic acid. This would seem to show that the iodide is not strongly reduced even by treatment with eikonogen.

Applied in a strong solution to a gelatino-bromide film, I have found it darkens the haloid salt of silver in the dark, even without alkali, though this does not agree with its behavior on the precipitated bromide. When added in very small quantities to the eikonogen developer, it also causes reversal of the image, but in larger quantities it stops reversal. Its action generally seems much more irregular than that of the other thio-carbamides, and I have not yet been able to fully investigate it. It seems difficult to prepare the salt entirely free from the ordinary sulpho-cyanate of ammonia, and to this some of the irregular action may be due. With the hydroquinone developer given above, it produces reversal on Wratten's "Ordinary" plates, and appears to be a very powerful accelerator both with this developer and with eikonogen.

(To be continued.)

SUGGESTION AND QUESTION.

FIRST—SUGGESTION.

To the Editor of the BULLETIN:

The article, "Weights and Measures," in a recent number of the BULLETIN, is "good reading." Your remarks in connection are also good reading. I think, however, you did not bear down enough on the ninth recommendation—

or, rather, you did not bear down "a little bit" on it, or you would have avoided the laughable error of using *grain* for *gram* or *gramme* as you did in the last word of the article.

Of course it is the proof-reader and the "devil" who deserve the blame, but when the "devil" can't tell the difference between gram and grain, it behooves us erring mortals to guard ourselves with care so that the "devil" will not dare to say his little sins from ours are risen; that what we tried to do was what he meant to, too, and when we get our dues then he'll take his'n.

Begging the "devil's" pardon, I proceed to my *question*, viz., What was the matter? Being of an experimental turn of mind, I have made or tried to make many things, and having succeeded with dry plates, shutters, etc., I tried to-day to make soluble gun-cotton. I succeeded far beyond my expectations. It was soluble in cold water and is this minute gently meandering down the stream of our sewer, having started on its way as limpid as the water containing it.

I took my formula from Estabrooke's "The Ferrotypes and How to Make It." I took 5 parts sulphuric acid, added thereto 4 parts nitric acid, then began adding small quantities of water till the mixture would dissolve a speck of cotton, then added half as much sulphuric acid as before. I set the tumbler containing the mixture in a tray of warm water, and allowed it to cool gradually to 130 degrees Fahr. I then began to add absorbent cotton, which dissolved quickly. I continued to add cotton till I had used at least an ounce. The last added dissolved slowly but completely. Again I added more cotton, and then I noticed that red fumes peculiar to nitrogen peroxide (NO_2) began to escape, and the solution became more limpid. Fresh quantities of cotton aggravated the trouble. The mixture began to get frothy. I prudently withdrew a few feet. It suddenly began to boil furiously, and most of the contents of the tumbler ran over into the tray of water. I began to think of going elsewhere, when the ebullition suddenly ceased, and there remained in the tumbler a black liquid like sulphuric acid, containing organic matter. I regained composure and emptied the remainder into the tray, then began to look for my cotton. Like McGinty,

"It must be very wet,
For I haven't found it yet,"

and I suspect it must now be a disembodied spirit.

My question was, "What was the matter?" I wish to ask another. In making gun-cotton, is there any danger of unwittingly making an explosive compound that is liable to go off and to take one off with it?

Awaiting your reply before trying again,

I remain, yours, uninjured yet,

F. E. PAYNE.

[The answer to the *question* is that the acid mixture evidently got too hot. In regard to suggestion, we tender thanks, and blame the proof-reader.—EDS.]

POISONOUS PROPERTIES OF URANIUM SALTS.

BY DR. LEO BACKELANDT.

URANIUM salts are used in several photographic processes, but the fact that these salts are all very poisonous is not sufficiently known among photographers. As early as 1824 Gmelin noticed the toxic properties of uranium salts, but very recently Woroschilsky has published his careful observations upon this subject.

His experiments made on animals demonstrate that subcutaneous injection of very small quantities of uranium solution surely kills when the dose is from $\frac{1}{2}$ to 2 milligrams per 1,000 grams of the weight of the animal. Death is also the regular result when relatively small quantities of uranium salts are assimilated by the digestive organs.

The general conclusion of these experiments is that uranium salts are extremely poisonous, and great care should be taken during their manipulation.

OUR ILLUSTRATION.

THE frontispiece of this issue of the BULLETIN is from a negative by Mr. Harold Serrell, and is one of the most beautiful pieces of landscape photography that we have seen for a long time. As a piece of reflection it is as near perfection as can be imagined, and the exceedingly fine work in the photogravure gives a very exact reproduction of the wonderfully perfect negative from which it was taken. We must congratulate Mr. Serrell upon his exceedingly beautiful result and the very perfect reproduction of it that we present to our readers.

THE DAGUERRE FUND.

SUBSCRIPTIONS ARE STILL IN ORDER.

THE following is a partial list of the contributions to the Daguerre monument as far as we have received notice of them up to this date. We shall take pleasure in adding to this list as the names are sent to us. These are in addition to the money raised by dollar subscriptions :

Dr. A. H. Elliott, \$25 ; G. Cramer, \$500 ; E. & H. T. Anthony & Co., \$500 ; W. V. Ranger, \$10 ; W. G. Entrekin, \$100 ; C. H. Codman & Co., \$100 ; Benjamin French & Co., \$100 ; G. Gennert, \$50 ; Rhinehart (City of Denver), \$50 ; Sheen & Simpkinson, \$25 ; D. P. Thompson, \$25 ; L. W. Seavey, \$25 ; Hetherington & Coover, \$25 ; *St. Louis and Canadian Photographer*, \$25 ; S. J. Dixon, \$25 ; G. D. Milburn, \$25 ; Brodie Mfg. Co., \$25 ; John W. Morrison, \$25 ; D. R. Coover, \$25 ; Fowler & Slater, \$25 ; Catherine Weed Barnes, \$20 ; S. L. Stein, \$20 ; L. C. Overpeck, \$10 ; L. J. Ullman, \$10 ; Mr. A. J. Riddle, \$10 ; *Photographic Herald*, \$10 ; Ph. Bonte, \$10 ; J. R. Pearson, \$10 ; Baker's Art Gallery, \$10 ; F. E. Hastings, \$10 ; Buffalo Argentic Paper Co., \$10 ; J. G. Edgeworth, \$10 ; E. M. Estabrooke, \$10 ; Loney & Gable, \$10 ; E. J. Pullman, \$10 ; G. H. Van Norman, \$5 ; W. Stuber, \$5 ; E. Stanton, \$5 ; J. M. Brainerd, \$5 ; E. Fieger, \$5 ; A. W. Judd, \$5 ; Eddy Bros., \$3 ; G. L. Hurd, \$2 ; T. M. Mackey, \$1 ; J. R. Clemons, \$1 ; Bausch & Lomb Optical Co., \$20 ; J. M. Appleton, \$25 ; M. A. Seed Dry Co., \$100 ; R. H. Moran, \$25 ; Geo. Murphy, \$20 ; F. W. Guerin, \$10 ; Arthur, \$10 ; C. Gentile, \$10 ; C. W. Motes, \$10 ; Benjamin Brothers, \$5 ; Elrobora, \$5 ; E. Decker, \$5 ; S. B. Brown, \$5 ; Eugene Smith, \$5 ; F. Plotser & Co., \$5 ; M. G. O., \$2 ; Geo. Sperry, \$2 ; Adam Heimberger, \$2 ; Charles E. Craven, \$2 ; J. E. Smith, \$2 ; J. C. Fitzgerald, \$2 ; W. E. Eusten, \$2 ; W. Noel, \$1 ; L. M. Jackson, \$1 ; S. F. Sloan, \$1 ; A. M. Wiggins, \$1 ; J. W. Vance, \$1 ; A. M. Collins Mfg. Co., \$100.

In addition to the above Mr. G. L. Hurd, and Dr. A. H. Elliott, of the BULLETIN, collected subscriptions to the amount of about \$130, the names being handed to Mr. H. McMichael.

Mr. G. H. Hastings, of 147 Tremont street, Boston, contributes one-third of the gross sales of the unmounted groups taken at Boston.

Mr. E. J. Pullmann, of 935 Penn avenue, Washington, has made an excellent cabinet picture, also larger sizes, of the finished Daguerre monument, copies of which are before us, and every one sending him one dollar for the fund will receive a copy of the cabinet size.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,

Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.
and a corps of practical assistants.

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AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

ANNUAL OUTING AND DINNER, SEPTEMBER
4TH.

AFTER spending a delightful day at Glen Island, the members assembled at the Café and enjoyed an excellent dinner together. The following ladies and gentlemen were present: C. Van Brunt, Mrs. Van Brunt, E. C. Townsend, A. Prosch, Colonel V. M. Wilcox, Dr. R. W. Wilcox, F. J. Harrison, T. C. Roche, James Forbes, Dr. Ehrmann, Professor Bedford, Dr. Backelandt, Salomons, W. I. L. Adams, E. Bierstadt, Dr. A. H. Elliott, Miss M. Benn, Mrs. Roberts, Miss Maud Mason, Captain C. M. Wilcox, Mrs. Mason, O. G. Mason.

The Chairman, Mr. C. Van Brunt, expressed regret that the time was so limited, also for the absence of their President and the loss of one of their members by death.

The Secretary, Mr. Mason, read the following letters:

NEW YORK, August 31, 1890.

DEAR MR. MASON:

Yours of the 28th came to hand yesterday. Unfortunately I have engaged rooms at High Falls Hotel, Dingman's Ferry, Pike County, Pa., for about a week, to commence to-morrow. We leave here on the 7.30 train to-morrow morning and arrive at our destination at 2.30 P.M. I take my camera with me, as this place is represented as the photographer's paradise.

Please convey to those present my regards and kind remembrances. This is the first time in the long years of my connection with the Photographic Section of the American Institute that I have had occasion to send a written excuse for absence from our annual outing. I will think of you on the 4th and in spirit will be with you, which will be the next best thing to being there in more substantial form. Work without flagging for the development of our wonderful art-science, is the sentiment I offer.

Hoping you will have a pleasant and profitable day, I am,

Sincerely yours,
HENRY J. NEWTON.

SCHOOL OF MINES,
COLUMBIA COLLEGE,
August 30, 1890.

MY DEAR MR. MASON:

The invitation to the annual dinner came to hand this morning. I regret to say that the day you have set for the dinner is the very one I leave town for my fishing excursion to the east end of Long Island. Therefore I will not be able to join in the festivities with the company. Extend my best wishes to such members as may inquire for me, and though I may be absent in person, I shall feel that I am present with you in mind, and know that the thing will be a great success by having so efficient a committee to take charge of so important an undertaking. Hoping soon to have the pleasure of meeting you, with kind regards, I am,

Sincerely yours,
L. H. LAUDY.

Mr. E. C. Townsend, being called upon by the Chairman, responded as follows:

Mr. President, Ladies and Gentlemen: Again we are met for recreation, strengthening of ties and the renewal of friendships; and in this lovely spot, surrounded by so many of the beauties of nature, bathed in the glorious sunshine, and swimming, as it were, in an ocean of rapture, should we not feel grateful for the privileges of the day and the occasion? For really this is an appropriate place for relaxation and sweet communion; and doubly sweet it is on occasions of reunion to find intact the chain that binds in social concourse. But, to-day, in the midst of our joys, comes the reminder to each of a severed link and a vacant chair; and we are called to mourn a loved friend, a companion and coadjutor—no more to behold his form or listen to the familiar voice, for he has obeyed the universal summons to "join the innumerable caravan that moves to the pale realms of shade." In our benedictions to his memory it is meet that we render a meed of homage to the heroic son who fell at his post of devotion to a stricken parent, and whose filial love met the reward only of an adjoining and untimely grave; but, should this dual death touch that sweet chord of sympathy that "makes the world kin," and by that touch impart to the survivors a stimulus to closer ties, truer trusts and broader friendships, then shall our dear departed not have died in vain. But all must die! The inex-

orable decree, "dust to dust," is emphasized throughout the realm of nature by continual and unrelenting death; and so, in a few short years at best, the dear ones, the friends and the scenes of our joys, our sorrows and life triumphs shall know us no more—our virtues as well as our faults being buried in oblivion; for the prophets tell us that "the heavens shall be rolled together as a scroll," and that time, even, shall cease, to which the poet adds his inspiration, that,

"The solemn temples, the great globe itself,
Yea, all which it inherit, shall dissolve,
And like this insubstantial pageant faded,
Leave not a rack behind."

Friends, our duty then is to the present and to the living future, recognizing that,

"Each life is but a fleeting breath,
Beset with pain and sorrow,
Each throbbing pulse e'en tells of death
That cometh with the morrow;
Then may we keep this end in view,
Whatever ill opposes;
To pluck the thorns and daily strew
Each other's path with roses."

Dr. Elliott, being called by the Chairman, said:

Mr. President: In the presence of so many veterans, I do not know exactly why I am called upon to say anything, but perhaps it will not be uninteresting to say a word or two about the recent convention at Washington, I see so few here that were present on that occasion. You will remember that the Photographers' Association of America decided to have a monument erected to Daguerre. This was accomplished recently, and the monument now stands in the rotunda of the National Museum at Washington. As I was present, and as the occasion was a very enthusiastic one, I feel pretty full of it at the present moment.

There was one thing that was very interesting, and that was the number of veterans that I saw there. For a young man it certainly was a great pleasure to me to meet a number of men that began when Daguerre began, that can remember the time when he gave us the art. There was Mr. M. Brady there, our friend Roche, Fassett, of Washington; the veteran E. Long, of Quincy, Illinois, and a whole line of others. It was a goodly sight, and one I shall remember as long as I live.

Now a word with regard to the monument. There have been a good many apprehensions as to its style and beauty. Having seen it, I can speak with a great deal of praise in regard to its beauty. It is certainly a very handsome piece of work, well worthy of the patronage of every American photographer. I think that if every one could see it they would only be too glad to have something to do with it, and there is room for some to come forward now and help out the subscriptions. I am not here, though, to speak of that alone. I would remind you of the fact that it is but a little over fifty years since our art began, and it is certainly astonishing to see the advance that we have made in these short years. Fifty years before that period the science of chemistry did not exist, and our art is largely dependent upon certain chemical reactions. It is very true that the Egyptians knew the effect of light upon silver salts, but

it was some fifteen hundred years before anybody took any notice of it, before the fact was utilized. It is a common legend that they marked mummy cases with nitrate of silver or some preparation of silver that blackened in the sun, yet it took one thousand and a half years to make it practical. The time is now when we look forward to the possibilities of photography, and it has struck me in talking to my friend Mr. Bierstadt, here at my side—we have been talking about pictures in colors—is it not pretty nearly time when metallic salts for making pictures will be abandoned? Is it not time that we stepped in and found out the effect of light on the organic coloring matters; that we found out the origin of the colors in the vegetable kingdom and substances not dependent upon metals. When we do this, when we begin to work on that line of work, we shall begin to take pictures in colors. I had the pleasure some time ago of receiving from Mr. Carey Lea some beautiful examples of his work on the photo-salts of silver. These are certainly very remarkable, though the colors appear to be due to the interference of light, at least in part. That is not exactly what we want. We want to register on the photographic plate a color, the counterpart of something that we see in nature. I believe that we shall do it only when we go into the organic part of nature and study the effect of light on organic substances.

I do not want to take up your time with a long scientific dissertation, and I will give place to more mature minds.

Professor Charles Ehrmann then spoke and said that he had come out of the woods, where he had been trying to "teach the young idea how to shoot," that his instructions were limited to the taking of landscapes, taking instantaneous shots occasionally, and explaining to the amateur photography with inorganic substances.

He regretted that an institution where there was required in its way such an immense amount of work, patience, diligence, study, and correspondence in every direction, was so little recognized; he also regretted that Mr. Clarke at Washington had disavowed the photographic educational institution in America, that our colleagues in England and on the continent elsewhere spoke much better of the school, and could not understand why such an important undertaking as the educating of young people in photographic matters was so little recognized, but that by and by it would be recognized, although it would require a great deal of work and still more patience. Regarding Dr. Elliott's remarks on photographing in colors, he said that this was the beau ideal of all photographers; that many thought it impossible to accomplish, while others, among them himself, thought it would be. He had confidence in Carey Lea's experience with photo-salts, and believed that he was the first one that had actually shown us in a scientific way how it possibly could be accomplished; that there was something in Dr. Elliott's statement about studying the action of light upon organic substances, and that it may be possible some time or other to photograph colors. Few Americans had

studied orthochromatic photography and a great many less had studied the action of light upon organic substances. One here, friend Bierstadt, had been recognized as a great investigator in that line all over the country; he had done more than any one else in America.

In regard to the action of light upon organic substances, he said that anybody who had studied it would coincide with Dr. Elliott that possibly in such a way we could at last accomplish photographing in colors; that perhaps no one present would ever see it done, but there was every possibility that it would be done some time or other.

Mr. Bierstadt being called, spoke as follows: I am not accustomed to speaking in public, particularly of my own doings in reference to colored pictures. I have not a great deal of faith in making photographs in colors, but I have a great deal of faith in making colored pictures by the aid of photography. The method I have investigated mostly is a method that is about twenty years old. I think it was suggested by Ducro du Hauron, practised by him, and patented by him. The method was something that has led up to orthochromatic photography. It was by making three negatives, each one to photograph only one of the primary colors, and in that way the three pictures are superimposed on one another from negatives made to photograph only one at a time, red, yellow and blue. This system has been carried out, and is a subject I have been interested in more or less for many years.

By means of screens through which we photograph, we make three or four negatives from any colored object, each one made through a screen photographing only one of the colors. The screen is changed for all the colors and then the pictures are printed one upon another, and in that way a very fair picture has been made to represent nature. As for copies of paintings, we succeed very well. Length of exposure is a little drawback, for I have exposed several hours for one object on one of these plates, but now can do it in less than a minute. My method differs from others simply in the addition of a fourth plate, which I think gives the true value to the shadows, because all our colors are colors only by comparison. Scientists tell us there is no such thing as color, simply waves of light that strike our eye. We acknowledge that there are none and regulate the waves of light that strike our sensitive plate, and use pigments afterward. We succeed in a very excellent representation of the object before our camera by means of pigments. That is all there is to the method. It was done twenty years ago and is the only method I practise in getting photographs in colors. There are a great many shades of blue and many of red and yellow, and to get one that will mix well with the others and produce the varied tints is the only problem in the way.

Dr. Elliott—I would like to say a word with regard to the beauty of the work Mr. Bierstadt has accomplished. I happen to be the fortunate possessor of one of his latest pieces. I have also seen work done twenty years ago, and wish to testify that this work of twenty years ago, and which was made by

Albert, of Munich, is no more to be compared with anything that he has done than a chromolithograph compares with a water color painting. Mr. Bierstadt has produced pictures of tints of all delicacy and shade and of the tone that we see in a painting. It is marvelous how close he has come to nature. It is not a chromolithograph or anything of that kind, but a gradation of light and shade which is exceedingly harmonious.

The time for departure had now arrived, and the company took the last boat to New York, after a most profitable and interesting day. A more perfect day for the photographer could not have been desired, and almost every one carried a camera. A notable feature of the occasion was the new magazine cameras from the house of our publishers. These were carried by a number of the gentlemen present and worked exceedingly well, a large number of pictures being captured without opening a camera or drawing a slide. The new P. D. Q. camera was also used by several of those present, and many pretty bits of scenery were secured. Here and there a Simplex camera was seen catching little bits on $2\frac{1}{2}$ inch square plates to work into lantern slides. This last little instrument is one of the simplest cameras ever invented and does very good work. There is no need for focusing, as the lens has a universal focus, consequently the operations consist in drawing a slide and tripping a shutter, the acme of perfection. We also noted among the larger instruments several of the Novel and kindred types made by our publishers.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—J. C. writes: Please let me know how the photometer is used to determine the time of exposure.

A.—There are several kinds of photometers or exposure meters on the market; but few of them are reliable. They usually depend upon the penetration of light through various thicknesses of tissue paper; the stronger the light, the greater the number of thicknesses the light will penetrate. By experiment with dry plates, the time of exposure of which is known for a given strength of light, the penetration of that same light through the photometer screen is noted and a number marked upon it. Unfortunately, no regard is taken of the color of daylight, which has an important effect upon exposure.

Q.—J. W. F. writes: Will you please give me a receipt for making retouching varnish that can be used as soon as put on?

A.—We presume our correspondent means retouching medium; in which case he can

use a saturated solution of resin in turpentine, adding enough turpentine just before use to dilute it about half, to give working consistence. Apply with a soft rag of fine texture.

Q.—W. H. B. writes: I have an unobstructed northwest skylight 10 x 12 feet with a 6 x 10 side light. From ten in the morning until evening I have direct sunlight on the sitter, causing me a great deal of trouble. The eyes and face do not seem to take well. How would tissue-paper on inside of skylight and sidelight answer, or a light coat of white paint? I am using two sets of shades, one of hollandes and one of muslin, but these do not work satisfactorily. Also please give me a good bath receipt for silvering albumen paper.

A.—We think the trouble must be in the color of your shades. Use white shades (white linen). Hollandes and muslin are generally too yellow and spoil the light. Use a 50-grain bath just acid with chemically pure nitric acid.

Q.—E. O. T. writes: Please inform me through the BULLETIN how I can make a print without silver, similar to a blue print, only green instead of blue. Give the details of process referred to on page 429 of BULLETIN. What is meant by catechu? I tried to tone a blue print with solution of aqua ammonia and gum catechu, but it made no change. How can I make permanent the rich violet color produced by treating a blue print with ammonia?

A.—Your trouble has been that you used ammonia instead of caustic soda or potash. Ammonia or ammonium carbonate does not work so well. Use a solution of caustic soda and catechu to give a green color. Try treatment with pyrogallol and caustic soda to convert a blue print into a purple one.

Views Caught with the Drop Shutter.

WE regret to note the death, on August 17th, of W. O. GOODRIDGE, of the firm of Goodridge Bros., Saginaw, Mich. He was forty-four years of age, and leaves a widow and two children to mourn his loss. Those who knew him best found him a good citizen and respected by all classes.

A. L. JACKSON has opened a studio at Tacoma, Wash., in the Ball Building, on C. Street. We wish him success.

C. W. DAVIS, of Charlestown, W. Va., has recently raised the price of his work, and the local papers praise him for it. It is a good lead for others to follow when they can do fine work.

Mr. WALLACH, of Sweet, Wallach & Co., has been visiting New York accompanied by Mrs. Wallach, and gave us a call.

S. T. BLESSING, of New Orleans, and his two daughters called on us a few days ago.

Mr. H. S. BELLSMITH, once the Secretary of the Photographers' Association of America, has recently opened a handsome studio in Denver, and on the occasion of his first reception night he entertained over 4,000 people. Music and refreshments were one of the features of the occasion. We wish him all the success his energy and enterprise deserve, and tender our best thanks for his kind invitation.

CARROLL ROSSITER, of Fort Wayne, Ind., died on August 25th, of congestion of the liver. He was only twenty-five years old, and employed by Bond, the photographer, of Fort Wayne.

WE regret to announce yet another death, this time by his own hand, and the victim is Mr. A. M. DE SILVA, of New Haven. He took morphine and died on Wednesday, September 4th. He was sixty years of age, and leaves a wife, two sons and a daughter. He will be remembered as a contributor to the BULLETIN and the "International Annual."

S. J. DIXON, the Toronto photographer, is also an enthusiastic athlete, and he recently walked across Niagara Falls on a tight rope. He certainly has a steady head and knowledge of equilibrium.

HIRAM J. THOMPSON, of Wabash avenue, Chicago, sends us an immense catalogue (No. 18) that is filled with everything that a photographer is likely to need. It is beautifully illustrated, and shows enterprise and good business experience.

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NEGATIVE BY ROCKWOOD, N. Y.

PRINTED ON N. P. A. EXTRA BRILLIANT ALBUMEN PAPER.

GOOD FRIENDS.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*

ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

OCTOBER 11, 1890.

Vol. XXI.—No. 19.

PHOTOGRAPHY WITHOUT METALLIC SALTS.

LAST issue we had to record the very interesting experiments of Colonel Waterhouse, on the reversal of the photographic image by the use of thio-carbamides (sulpho-ureas). We have now to notice a process equally as curious and interesting, the production of pictures without the use of metallic salts, and by the aid of another series of organic bodies also containing sulphur.

At the last meeting of the British Association for the Advancement of Science Messrs. A. G. Green, C. F. Cross and E. J. Beven read a paper on "The Action of Light upon the Diazo Compounds of Primuline and Dehydrothioto-luidine, a Method of Photographic Dyeing and Printing," in which they state that they are able to produce photographic prints in the colors red, maroon, yellow, orange, brown and purple, by the action of light upon primuline and subsequent treatment of the exposed substance with various other chemicals of an organic nature.

For some time past we have been convinced that the field of organic chemistry would yield a rich harvest for those who would study the action of light upon organic compounds, and we hope that these experiments of Mr. Green and his *confrères* are but the beginning of a long series of brilliant results that will be as wonderful in their development as those that followed the discovery of the first aniline color (mauve) by Perkin in 1859 during his search for artificial quinine.

The primuline method stated briefly is as follows :—The new coloring matter, primuline, in the form of a light yellow powder, is dissolved in hot water containing a little common salt. This bath may be used to dye a fabric such as wool, silk, cotton, or linen, or even a gelatine coat upon a glass plate. The colored material is now dipped into a bath of sodium nitrite (not nitrate) containing about $\frac{1}{4}$ per cent. of the salt, and strongly acid with sulphuric or hydrochloric acids. After washing it is exposed under any design that it is desired to copy, to sunlight, limelight, or the electric light. In bright sunshine the exposure requires only half a minute, and the correctness of the exposure is determined by a small test piece exposed at the same time. After exposure, the print is developed in a $\frac{1}{4}$ to $\frac{1}{2}$ per cent. solution of a phenol or amine, made alkaline or acid as necessary, and according to the color desired. The following substances are used : An alkaline solution of beta-naphthol produces red ; an alkaline solution of beta-naphtholdi-sulphonic acid gives maroon ; an alkaline solution of phenol (carbolic acid) gives yellow ; an alkaline solution of resorcin, orange ; a

solution of phenylene-diamine hydrochloride, brown, and a solution of alpha-naphthylamine hydrochloride, purple prints.

Prints in several of the above colors can be obtained by mixing the developers with starch and applying them locally with a pad or brush. After developing a thorough washing in water is all that is necessary, and the prints are finished.

The peculiar reaction upon which this process with primuline depends is that the light effects a decomposition of the diazo compound formed by the action of the sodium nitrite and acid. This peculiar compound contains nitrogen in a state of combination that, under the influence of the rays of light, evolves nitrogen gas which escapes. Therefore those parts of the substance that are decomposed are incapable of forming coloring matters with the developers that are subsequently applied. By this means from a negative another negative is obtained by development (or a positive from a positive) with the primuline forming the picture of the exposed parts. This nitrogen theory is only tentative, and the decomposition may be much more complex. Future experiments are necessary to prove this.

The possibilities of the process are certainly very numerous. For the engineer and draughtsman here is a substitute for his blue process paper which has the great drawback of giving white lines on a blue ground, at least in the process as generally used. We can also conceive of the application of this new method to the production of some very beautiful effects in transparencies upon glass and celluloid. Furthermore, the opportunity for the display of artistic skill by using local development with paste opens a wide field for those given to decorative work.

Although the colors mentioned above have a limited range in the spectrum, should the process prove useful, a complete series of developers for all the rays from red to violet will be easily produced by the chemist. These organic bodies are now so well understood in their chemical tendencies that a whole range of colors of far more varied hues than those usually seen in nature will dazzle the eyes with the same wonderful richness that characterized the advent of the original aniline dyes.

Let us hope that all that is now claimed for this new process may be fully demonstrated in the future; that it is but the first glimpse of a field of discovery resplendent with all the beauty that colors give to nature, and that photography will be enriched during the next half century with a series of triumphs that will make the monochromes of to-day appear tame and sad by comparison.

EDITORIAL NOTES.

ONE of the interesting applications of photography at the exhibition of the recent Medical Congress at Berlin was a representation, by Professor Exner, of the eye of the glow-worm, showing the retinal image. The eye of an insect, as is known, differs from that of a human being in that the latter projects the image on the retina in an inverted position, while the former, being formed of a large number of very small facets, each one of which is connected with a light sensitive nerve, conveys the image to the retina in the correct position and with the same effect that the photographic is seen through a very small opening, with the exception that it is not inverted, each facet giving a section. The exhibit of Professor Exner exemplified these facts in a most interesting manner.

It is a matter for regret to all thinking photographers, as well as to all, that a part of that famous and beautiful structure, the Spanish Alhambra, has fallen a prey to the ravages of fire which has destroyed much of its best architectural features. We are glad to know, however, that steps are being taken for its immediate restoration, and that it will again appear as an example of a style of architecture representative of an epoch that has passed into oblivion.

By the aid of the microscope in connection with photography, it has recently been demonstrated that the dull phosphorescent light which is frequently to be observed on decaying animal and vegetable matter, is due to the presence of a vast number of bacteria which are possessed of the self-luminous power similar to that shown in the glow-worm and the phosphorescent animalcules of the ocean. The old accepted idea and explanation of this luminous effect was, that it was the result of a slow oxidation of the decaying matter, but Professor D. B. Fischer, of the University of Kiel, has lately succeeded in obtaining some photographs of such specimens, which were made wholly by the light of their own presence. The photographs in question are extremely interesting and remarkable from the fact that the actinic power of the luminosity is so infinitesimal.

WE regret to record the recent death of Herr H. Goltzson, of Berlin, one of the contributors to the last volume of our "Annual," and a man whose optical researches have done much to bring the stereoscope to its present improved state. Herr Goltzson was, besides being an enthusiastic amateur in photographic lines, a musician of many attainments.

CONSIDERABLE excitement has been stirred up in Philadelphia within the past few months because in several instances photographers, both amateur and professional, have been making groups of the pupils in the schoolrooms, which is against the rule of the Board of Education, providing that schoolrooms and buildings shall only be used for school purposes. The Board has issued a circular prohibiting any further photographing in the school buildings and requiring the principals to keep any and all photographers from entering the schoolhouses with cameras.

WE are in receipt, from Mr. William Reginald Ream, of Toledo, O., of a dainty little composition in the way of a wood scene, with the figure of a lady in middle foreground, which shows good taste in lighting and arrangement, and would commend Mr. Ream's effort and advise him to continue; he will, as he gets deeper into the art, find ever-increasing interest and enjoyment in it.

IN a paper read by Professor J. J. Hummell before one of the foreign societies recently on "Fast and Fugitive Coal Tar Colors," it was shown that while many coal tar colors are of an extremely fugitive nature, yet very many of them have the reputation of not being fast colors from the method of their application to the fabric, instead of from the quality being inherent in the color itself, and of these, if they were applied with a different mordant than the one used, many would be found which would equal in resistance to the effects of light the so-called fast natural dyes.

THE California Camera Club, of San Francisco, enjoyed a most delightful field day on the 8th of last month, on which occasion the club, to the number of nearly one hundred members, made a cruise about the harbor of San Francisco on a large and commodious tug boat, chartered for the occasion. The tug was fitted with dark rooms and all needed accessories, and the day was one of unalloyed pleasure and profit to all. We were so fortunate as to have been invited to attend, but so unfortunate as to be unable to do so. Our thanks are tendered to the club, however, for the remembrance, and our congratulations on the good time they enjoyed.

THE price of aluminum is still steadily declining, being now seven shillings, or \$1.75 per pound, in England, and \$1 per pound in alloys in the United States. If there be found some such method as has lately been claimed for extracting it from clay at a low cost, it will soon be within the reach of all for ordinary use as a substitute for copper, brass and zinc.

PROFESSOR W. M. DAVIS, Harvard College, Cambridge, Mass., desires to correspond with professional and amateur photographers from whom views of New England landscapes can be obtained.

As an instance of the degree to which the several methods of process printing have revolutionized the reproductive art, may be cited the fact, that the class in wood engraving which has so long been a feature of the Cooper Union Art Schools, has been discontinued, and in its place is to be taught pen and ink drawing. The reason for this change is, that wood engraving is now held to be of commercial value to only a limited number of expert workers, and to be superseded in all general use by the photo-engraving and similar processes.

M. LEON VIDAL recommends for orthochromatic work screens prepared by dissolving pyroxiline in amyl acetate colored by a little erythrosine or aurantia. After flowing on glass plates and drying for two days, it is removed from the glass in the shape of a film by soaking in water and then drying between blotters. He then advises cutting the film into small squares and pasting over the apertures of the diaphragms when in use.

M. PERROT DE CHAUMEUX gives the following formula for negatives which have turned yellow from hydroquinone development :

Corrosive sublimate.....	1 gram.
Salt.....	2 grams.
Water.....	100 c.c.

HERR MAX JUNGHAENDEL, of Vienna, has lately completed a trip to the land of the Pharaohs, returning with a remarkably fine collection of photographs, many of which are very large, measuring 30 x 40 c.m. The entire series is to be reproduced in heliogravure in a sumptuous work on Egypt, now in preparation.

WE learn from our exchanges that Messrs. Baligny and Herré have been investigating the causes of yellow discoloration of the gelatine film after development with alkaline developers, with the result that such discoloration may be

removed entirely by washing after development in a bath of citric acid, 25 parts to water 1,000 parts. The turning in color is found to be the result of an organic coloration of gelatine, destructible by acid baths, but made more intense by the action of alum or chrome alum.

WE regret to learn of an accident which happened during the latter days of July to our esteemed friend, Professor W. K. Burton, of Japan. Professor Burton, with Professor C. D. West and a Japanese photographer, were about making some experiments in deep-sea photography by the aid of flash-powder, when the bottle containing it suddenly exploded, lacerating Professor Burton's leg and badly injuring a native assistant. We are, however, glad to say that at latest accounts Professor Burton was doing well, though his recovery will be a slow and tedious matter. We understand that he is now up and about, though in a very quiet way. We offer our congratulations that the accident was no worse.

ON THE REVERSAL OF THE NEGATIVE PHOTOGRAPHIC IMAGE BY THIO-CARBAMIDES.

By COLONEL J. WATERHOUSE, B.Sc., *Assistant Surveyor-General of India.*

(Continued.)

I HAVE also made a cursory examination of the effects of the simple carbamide or urea, which differs from thio-carbamide in containing oxygen in place of sulphur, its formula being $\text{C O} < \begin{smallmatrix} \text{NH}_2 \\ \text{NH}_2 \end{smallmatrix}$

A 10-per-cent. solution of urea produces no visible effect on silver bromide in the dark. Carbonate of soda added gives off no ammonia, but rather a smell of caustic alkali, and did not darken the bromide. Nitric acid dissolves no silver in the dark. With eikonogen the alkaline bromide was reduced at once to a dark gray. Nitric acid cleared off darkened product, and the solution gave an abundant precipitate of chloride with muriatic acid. With silver chloride treated in the same way carbonate of soda gives off no ammonia, but the same alkaline smell, and causes no darkening of the chloride. With eikonogen the alkaline chloride turned gray at once; nitric acid cleared, and muriatic acid gave a plentiful precipitate of chloride.

With the iodide very little visible change was effected by the soda solution or by eikonogen, though the latter turned it of a greenish yellow.

Applied to an ordinary gelatine dry plate, a 10-per-cent. solution did not visibly darken the film, either by itself or with carbonate of soda.*

Urea used with the eikonogen developer shows no tendency to cause reversal, whether used in the same small proportions as the thio-carbamides or in larger ones. I have not yet tried it with other developers. As remarked before, this would seem to indicate that sulphur exerts a very important influence in causing the reversal. It may be noted, however, that sulpho-cyanate of ammonium added to the eikonogen developer, though it produces a curious silvery metallic surface on the plate, shows no tendency to reversal; nor does hydro-sulphate of ammonia nor hypo-sulphite of soda. Mustard oil is itself somewhat soluble in water, and phenyl mustard oil (phenyl-thio-carbamide) slightly so when boiled.

* The experiments on the darkening and reducing action of all these thio-carbamides and urea on the silver haloids have given somewhat variable results, and require further investigation. There can, however, be no doubt of a reducing action taking place without the aid of light.

Mustard oil, with or without sulphite, seemed to act as a strong restrainer, the images being clear and weak, with no sign whatever of reversal. The phenyl-thio carbamide gave a good dense image with no abnormal effect whatever.

Alloxan, which is produced by the action of strong nitric acid on uric acid, proved a strong restrainer, and gave no sign of reversal when added to the eikonogen developer; indeed, its action seemed beneficial, as also did that of bichromate of potash, which equally showed no tendency to produce reversal.

I have not yet had an opportunity of investigating the action of the spectrum with reference to the reversal of the image with these thio-carbamides, but from a trial made with a small direct-vision spectrograph on Wratten's plates developed with eikonogen containing thio-sinamine, it was found that reversal took place only in the ultra-violet from the H lines onward, the blue and other rays toward the less refrangible end remained unreversed. With orthochromatic plates the same result was obtained. The addition of bromide to the developer was a great advantage in promoting the reversal and obtaining clear definition. Further trials with the diffraction spectrum appear to show that the reversal is almost entirely a matter of exposure, and may be obtained in any part of the spectrum.

The peculiar feature in these reversals with the thio-carbamides is that the camera exposures are perfectly normal. Over-exposure prevents reversal, and the best results are obtained by somewhat under-exposing. Views with bright sky and dark foregrounds, or other subjects with strong contrasts of light and shade, are most difficult to obtain fully reversed. In copying it is not so difficult to obtain perfect reversal, though the lights leave much to be desired in clearness. I have tried various clearing agents, but so far without success, though further trial will probably give better results. The addition of bromide to the developer aids in keeping the lights clear, but in excess it attacks the lighter half-tones.

With the phenyl and allyl-thio-carbamides in some cases, the image first of all develops quite normally and then gradually changes, the shadows becoming dark and the lights paler, so as to show a positive image before fixing. In others, especially if a large proportion of the thio-carbamide is used, the image comes up foggy all over, and the reversal only appears on fixing. The reversing effect is most noticeable on the unexposed edges of the plate protected by the rabbet of the carrier, and these generally develop into a strong dark border round the plate. Some of the images obtained have a beautiful rich effect, though not always perfect in the reversal nor clear in the lights.

On the whole, the best results have been obtained with the allyl-thio-carbamide, or thio-sinamine, and it seems likely that it will work well with hydroquinone, at any rate for copying. The images obtained with it are dense and full of detail, and quite different to the weak gray reversed images produced by solarization or over-exposure. Phenyl-thio-carbamide with bromide and ammonia also works well with eikonogen, and gives fair clearness and density in copying.

As regards the theory of the action of these thio-carbamides in producing this remarkable reversal of the images, I have been so fully occupied with endeavoring to obtain some facts from which a theory might be deduced, and also to work out a practical process, that I have not yet been able to give much attention to the question of how the results are obtained. In any case it would be

difficult to offer a valid opinion in the present state of our knowledge of the curious phenomena connected with reversal and solarization, and without knowing more of the delicate and complicated chemical reactions involved. The difficulty is increased by the fact that—at least so far as I can ascertain from the text-books—there is no record of a substance which, added to the developer, will produce reversal with certainty. Eder notes that an excess of hyposulphite of soda in the ferrous oxalate developer will sometimes cause it.

The only parallel case of reversal I have been able to find is that recorded by Carey Lea as caused by the action of hypophosphite of soda on silver bromide films. I have, however, tried the hypophosphite in various ways on ordinary dry plates, by treating them with solutions of different strengths, and then developing either wet or dry, or by adding the salt in various proportions to the developer; but neither with the eikonogen nor ferrous oxalate developers have I been able to obtain any sign of a tendency to reversal, and the same applies to solutions of glucose alone, or with ammonia, and of manna with soda. All these substances, applied to the film in various proportions, showed, especially the last, a marked increase of reduction and density on development, but no sign of reversal. The effect was quite different to that of the thio-carbamides, and the action of the latter, in darkening and reducing the haloid salts of silver without the aid of light, is immensely stronger.

I have not yet been able to enter into the question, but it seems not impossible that this darkening and reducing action of the thio-carbamides may have some bearing on the production of Carey Lea's photo-salts, though if any such salts are produced they would probably contain sulphur.

Reversal of the image is, as a rule, quite abnormal, and usually occurs from over-exposure or some irregular action of light during development. With dry collodion bromide plates it may be favored by the presence of certain forms of organic matter, such as some of the aniline dyes, and in the case of gelatine dry plates it may occur by long keeping of the plates before development. Some years ago, Captain Abney fully investigated the phenomena, and they have more recently been discussed at length by Professor Meldola, in his excellent treatise on the *Chemistry of Photography*. Captain Abney attributes reversal to oxidation of the subsalt of silver, formed by the action of the first impact of light on the exposed salt of silver, the rays of lower refrangibility being powerful accelerators of this oxidation; also to the presence of alkaline haloids or of mineral acids. The presence of a soluble nitrite or sulphite, or other reducing agent, is also said by Captain Abney to be inimical, while the presence of oxidizing agents is favorable.

In the present instance, seeing that an ordinary gelatine dry plate, which with a normal exposure and developer will develop a negative, will, with the same exposure, and merely by the addition of a little thio-carbamide to the developer, develop a positive, it is obvious that the reversal is not caused by any abnormal action of light nor by the action of any special rays of the spectrum, and must be purely due to chemical causes. Over-exposure, as we have already seen, is unfavorable to the reversal, and although the ultra violet rays appear most active in producing it it may be obtained in any part of the spectrum.

Against the theory of oxidation there is also the fact that the thio-carbamides, which undoubtedly are the active agents in producing these reversals, contain no oxygen, and, on the contrary, appear to be powerful sensitizers and reducers.

Then, again, the presence of sulphite in the developer does not stop reversal and even seems to favor it. Pyrogallol with sulphite has produced reversal with thio-sinamine, when with nitric acid and bromide it did not.

Although the action of the thio-carbamides in producing this reversal thus appears to be in direct opposition to the generally accepted theory as stated above, I think it will be possible to reconcile the facts with the theory, and that these reversals follow the ordinary rules.

With normal exposure and development a gelatino-bromide dry plate gives a negative image; but if the exposure be prolonged, or if the film has become oxidized from any cause, there is more or less tendency to reversal, and the original action of light, which would produce a normal negative image, is undone, and a positive image is produced. In the present instance we have in the developer a substance which is capable of liberating halogen without the action of light, and, apparently, of oxidizing and hardening the gelatine film. Thus the film, although it may only have received a normal exposure to light, is really in the same state under the developer as if the exposure to light were being continued and halogen being liberated all over it, as in the case of over-exposure. The halogen thus set free would appear to attack the parts reduced by the normal action of the developer, while the developer and the alkaline thio-carbamide complete the reduction of the unexposed parts and thus bring about the reversal. During the process the thio-carbamide probably becomes oxidized and loses sulphur which would combine with the silver, and from the appearance of the images very probably does so. From the experiments described above it would appear that, with thio-sinamine, at any rate, a soluble sulphide is formed by the addition of the alkali. In the case of thio-carbamide or sulph-urea, ammonia is also evolved by the alkali, and this may be the cause of the irregularity of the results obtained with it. The fact of the reversals being most readily obtained with eikonogen would seem to show that it also exerts some chemical influence on the result. Some of the plates produced show a peculiar blue tint, very suggestive of Prussian blue, but how any such compound of iron could form it is difficult to see.

The theory I have given above can, however, only be considered a provisional conjecture, which requires further investigation before it can be confirmed.

The results obtained seem to warrant the hope that it may be possible to perfect the process for practical use, but a great deal of work has yet to be done before the conditions of successful working can be fully ascertained. As in all these processes of reversal, the balance between reversal and non-reversal is a very delicate one. In any case, an entirely new method of producing reversed images, with so many novel features, must be of interest, and, it is to be hoped, may throw some light upon the still unsolved problems connected with the formation and reversal of the developed photographic image.

THE DISPLAY OF APPARATUS AT THE WASHINGTON CONVENTION.

SECOND NOTICE.

THE display of burnt-in photographs upon table ware and porcelain ornaments by Benjamin Bros. & Werner, of Cincinnati, was very fine, and their space was crowded with admirers. It was a surprise to the members of the Photographers' Association, and the first of the kind ever exhibited at these con-

ventions. Both the photographic and decorative work was excellent, and we believe there is a great future for this application of photography.

Owing to lack of space, the A. M. Collins Manufacturing Company could not make their usual handsome display. Mr. Hastings and another gentleman represented the company, and occupied desk-room only, where samples were exhibited.

Benjamin French & Co., of Boston, had a handsome display of Voigtlander and Darlot lenses in charge of Mr. Wilfred French, who is well posted upon the merits of the well-known lenses.

Codman & Co., of Boston, had on exhibition the Centennial camera stand exhibited at Boston last year, but it has been so greatly improved that the convention judges awarded it the prize for improvements in apparatus. It is certainly one of the best and most useful inventions in the way of camera stands.

W. G. Entrekin, of Philadelphia, had his usual display of handsome burnishers. These are so well known for their good qualities that comment is unnecessary.

Otis C. White, of Worcester, Mass., had a fine display of his ingenious devices in the shape of studio chairs and the requisites for posing and lighting in the studio. His new style of base and pedestal to the posing chair, fitting itself automatically to any irregularities of the floor, also with special clamp to take up excess of motion from the rotary movement of the elevating device, is excellent and thoroughly practical. All the apparatus, supports, head-screens, baby chairs, etc., were finely finished and remarkable for the application of Mr. White's ingenious mechanical inventions. Several medals awarded for these inventions are proudly owned by the Worcester manufacturer.

Hetherington & Coover, of Chicago, manufacturers of backgrounds and accessories, made a handsome display, and were tireless in their attention to the numerous questions of the visitors. The variety of backgrounds exhibited was bewildering, and we can only recommend our readers to send for photographs of them if they desire to select anything of this kind. Mr. Hetherington has recently published a very handsome selection of studies from well-known American and European photographers, which we shall take pleasure in speaking of more fully at another time, when we can do it justice.

E. J. Pullman, the enterprising photographic merchant of Washington, had a full display of cameras made by all the principal manufacturers, including portrait view and detective cameras.

A new magazine camera, named the "Genii," the magazine of which is but $1\frac{1}{8}$ inches in thickness, and holding twelve plates or twenty-four cut films, each exposure being automatically registered, so that no mistake can occur, was seen at this exhibit.

Also a new device for making developed prints by artificial light, called the Hoover Contact Printing Box, for contact printing on the Buffalo enameled Argentic paper, adapted to printing from the roll or cut sheets, and suitable to any kind of bromide paper.

The exhibit of backgrounds and accessories made by L. W. Seavey was in charge of Mr. Charles H. Davis, assisted by Messrs. Caldwell and Peterson. As at Boston, the goods were shown upon a balcony, quite apart from the balance of the convention. Notwithstanding their seclusion, the crowd found them, and those who called were well entertained by exhibitions of artistic posing and

music, the latter being one of the most entertaining features of the entire convention.

During each afternoon a stringed orchestra occupied the balcony, and rendered operatic selections that could be heard throughout the entire building. In posing, Mr. Davis had the assistance of a charming Washington young lady, and photographers were enabled to understand by demonstration how the various articles could be used to advantage. As usual, the backgrounds and accessories shown by Seavey are of the highest order of artistic and practical value.

Packard Bros., Boston, Mass., manufacturers of backgrounds and accessories, displayed a line of nicely executed 8 x 10 backgrounds. Also a full line of their 6 x 8 low-priced series, together with novelties in vignette and cloud grounds.

Their novelties in flower foregrounds, field fronts, and accessories attracted much notice.

The Caswell multiplex background holder was a very ingenious device for holding a number of backgrounds at once and yet giving any particular ground at a moment's notice. It should be seen to be appreciated.

In regard to the displays of the dry-plate manufacturers, the first to attract notice on entering the hall was that of the Seed Company. As usual, they made a large and handsome exhibit. Among the artists represented with pictures made on their plates were Steffens, of Chicago; Paul Brown, of Wilmington, Del.; Falk, of New York; Morrison, of Chicago; Rösch, of St. Louis (grand prize man of last year); Baker, of Columbus, O.; Max Platz of Chicago, and S. W. Burnham, of Lick Observatory, California.

The display made by the Wuestners Dry Plate Works proves conclusively that just as good plates can be made in Jersey City as in any other city in the United States.

The large combination made by Anderson, of New York city, was the center of attraction. It represented a group of the heads of police covering 6 x 8 feet, and is the largest and finest picture of the kind ever exhibited under glass at this or any other convention. Sarony, of New York, had very fine panel and 18 x 22 pictures. Gutekunst, of Philadelphia, 18 x 22. Kuebler, of Philadelphia, one large photograph of Mr. Edward Wuestner, of Eagle Dry Plate Company. Vaughn, of San Francisco, showed wrestlers very fine in posing and lighting. Randall, of Ann Arbor, Mich., had church singers, four little four-year-old girls well posed, and reflecting great credit on the artist. J. J. Gibson, Ann Arbor, had cabinets and 14 x 17 pictures, an excellent display. Ford & Humphrey, of Kalamazoo, Mich., displayed fine cabinets. Frank N. Tomlinson, of Detroit, Mich., had some excellent large work, and a double of Mr. Tibballs, the operator. Also very fine and well-selected collection from E. Eisenhardt, of Detroit. Mrs. A. B. Taylor showed some pictures with excellent posing, also fancy pictures (theatrical). Hardy, of Boston, excellent large and small work. George H. Hastings, of Boston—Everybody knows his work. D. R. Clark, of Chicago, excels all previous efforts in posing and lighting.

J. K. Stevens, of Chicago, is deserving of much praise for the uniformity of his every-day work.

Mr. Varney's collection of cabinets was very nice. Six large 18 x 22 heads from Mr. Thomas, of Racine, Wis., were much admired.

O. P. Scott, of Chicago, had six large heads that need very little comment from us; they were very fine.

The Cramer Dry Plate Company had, as usual, a fine and thoroughly well-arranged display. Here we saw the work of our good friend Guerin, of St. Louis, with some fine cabinets and 11 x 14 pictures, all well modeled and artistically arranged. Our readers are acquainted with his work. Dana, of New York, also had some fine cabinets and 11 x 14 pictures, of the same excellent character as those seen in the illustrations of the BULLETIN some time ago. Strauss was represented by a number of 10 x 12 genre pictures of his well-known standard. Rösch had 11 x 14 studies. L. C. Overpeck showed some uncommonly fine machine photographs. Landy sent some 14 x 17 portraits; Hardy some 11 x 14 studies. McMichael was represented by 18 x 22 studies on Enoch Arden that were very fine. Tomlinson, of Chicago, had a number of fine 10 x 12 groups and studies. Decker & Wilbur had 11 x 14 studies of their well-known fine work. Massey showed some very fine work in architectural and interior photography; this was difficult to surpass. Watkins showed a number of beautiful views of California scenery, the photography of which was beyond anything we have yet seen from that region. W. H. Jackson, of Denver, was represented by some of his superb views of Florida and other sections. Altogether, this display was worth a day's vacation to see it and study the marvelous effects obtained on these wonderful plates.

The exhibit of the Allen & Rowell Company, of Boston, contained several striking features, among which may be mentioned life-size portraits in carbon of Longfellow, Oliver Wendell Holmes and William Lloyd Garrison, made in 1876 by Allen & Rowell, for exhibition at the Centennial, where they were awarded a medal. These pictures, although nearly fifteen years old, are as brilliant and perfect as the day they were made, showing the advantage of this process as possessing permanency, in addition to a greater softness and beauty than can be obtained by any other.

All materials for working the carbon process, together with full directions for its manipulation, can be obtained from the company.

A carbon enlargement, finished in pastel by Hanlan, of Boston, from one of Mr. Peabody's photographs of the United States flagship "Chicago," was also exhibited by this company, and attracted universal attention. A special feature of their productions is their varied nature, the exhibit containing samples of negatives on ivory films, prints on positive films, reproductions in heliotype and photogravure from (yacht) negatives by Mr. Peabody on stripping plates, a collection of lantern slides on their plates, and an assortment of portrait work, among which is noted work by Dana, of New York, and Baker, of Columbus, O.

A large portion of the exhibit is made up of instantaneous yacht views by Mr. Peabody, the marine photographer, of Boston. His exhibit of these views in the art department secured for the company the first prize, a silver medal.

The Bonte Frame Company, of Cincinnati, O., manufacturers of photograph and portrait frames, made a fine display of their designs of frames.

This company have for forty years made a specialty of frames for artists' and photographers' use, and do their business exclusively with that trade.

Smith & Pattison, of Chicago, exhibited their well-known paper-cutter and the Globe burnisher, which is also widely known among progressive photographers.

Among the single exhibits the three-point camera stand of Bonine, of Altoona, Pa., attracted considerable attention. It is built on a triangular base, and the claims for it are that it is quickly adjusted, very practical, and most

easily operated. It certainly was finely made, and appeared to answer all requirements at the will of the operator. Another interesting single exhibit was the Quartley compact bromide enlarging cabinet. This was an apparatus for making bromide enlargements of any size in the open air, under a skylight—indeed, anywhere, and without a dark-room. The size shown occupied about three feet of space and made enlargements from 10 x 12 to 18 x 22. It appeared very practical.

There may be some exhibits that we have overlooked, but the crowded condition of the exhibition hall is our excuse. The manufacturers were never before packed in such close quarters.

A TRIP FOR A HOLIDAY.

BY W. E. PARTRIDGE.

NEW LONDON and the River Thames are almost as unknown to New York amateurs as though they were a thousand miles distant. There are boating enthusiasts who go to see the races and paint the town red when their favorites win. But upon such occasions the camera has little to do. The hand camera, if it is taken, is busy with the racers and the town; the hills and the river are practically unknown.

From New London to Norwich the river valley is as full of beautiful compositions as any thirteen miles of winding water in all New England. Quaint clusters of houses, gardens that look like toys, tree-shaded hills, old ship-yards and old hulks, all along tempt the camera at almost every turn. Going in the train, one would wish to stop two or three times in every mile to obtain some charming subject. Every turn of the track, and the road is not straight by any means, brings some new beauty in sight. How to see the interesting things, and where to begin photographing, are important questions to be answered. As the most convenient and easiest way of reaching the spot, it is to be supposed that the amateur has come from New York by boat. In the morning he can begin upon the steamer's deck just as soon as the sun is up above the Groton hills.

If the camera could only put upon the plate the poetry of a gray, clear morning, with the cool salt breath from the Sound drifting away inland, it would be well worth while to turn out with those who take the steamboat train and are off in the leaden dusk which comes before daylight. There nature seems like one vast half-finished etching, printed before the plate was quite clear of ink. A deep "tone" is over everything. But it is worth while to rise with the early ones and wander about upon shore and wharf for the sake of seeing how strange the world looks in its gray night-clothes. Lights dot the harbor and cling to the black specks upon the water-specks that show where vessels lie. But for the click of wheels upon the dock the world is as quiet as the dead. The rattle of the trucks only serves to accent and emphasize the silence. By and by the white houses on the other shore begin to show lights. Plumes of pale smoke rise here and there. Perhaps a queer black, high-bowed fishing boat, a Menhaden steamer, comes out from a little fleet of black hulks. Hulls and rigging are drawn sharp against the sky, as though engraved with the finest needle. This porgy fisherman slides across the foreground like a ghost in a theater. It seems as though the rippling water should make some sound. She seems near and is far away. The details are strangely distinct, and yet much is lost that

seems plain. The whole thing is unreal, and every moment one expects to hear the tinkle of a bell or the roll of a drum and see the steamer and that shore opposite slide away into the wings or rise up behind the drop and disclose another scene altogether. It seems highly improbable that such an unnatural wharf, so strange in color and curious in proportions, should have happened except in the scene-painter's mind.

So one waits for daylight, earnestly wishing, however, that the camera could give an idea of those eerie morning hours when the world seems less real and tangible than the dreams one has just left. When daylight has come set the camera up on the steamer's upper deck at the bow, and take a view looking south. It is not a bad plan to try a wide-angle lens and take in a part of the bow, with the stocks of the anchors and any of the characteristic features. If the schooner be one of the old-fashioned "droghers," ungainly and worn, a striking thing can be obtained by using the steamer's tall white bow for a background and taking the schooner's hull against it.

In general, the best pictures here will be obtained by taking "little bits" and avoiding extended views of the harbor and river. This holds true also upon the docks, where the interest is centered in the details.

Those who want to take what everybody else takes, and what all the professionals have, will go over to Fort Griswold and the Monument. That is all right. But while they are after the fort and the bridge the lover of the beautiful will take his camera and start along the railroad for a trip on foot. But, if wise, he will be ready for work at any instant. Or he may go at once by train to Norwich and work his way back on foot. The late train will pick him up and land him at the dock in season for the return boat if only one day can be spent on the river. By going over the ground first one easily gets an idea of the places which it is most desirable to photograph.

Taking this excursion, one will find in Norwich, a mile or so above the station and on the line of the railroad, quaint tenement houses with the staircases outside. Norwich itself is picturesque, and so is the stream that wanders down to it along the railroad. But one should not go up into the wide streets and business parts of the city. It has had its respectability made into nice pictures, which can be had at twenty-five cents each. They are very nice, but they are not wanted for art. They belong with the guide-books, and are then interesting. The artist keeps down near the river. Along the water there are places where the houses, perched among the trees high upon the bank, seem to overhang the stream.

If time does not press, it will pay to go to the second station above Norwich, and from there begin the journey back to New London. Niantic is as far as it will pay to go in search of photographic subjects. But from that point down there is an almost constant succession of beautiful views which make fine photographs.

Willimantic is a lovely place, but the pictures are not up among the public buildings nor along the principal streets. Here, indeed, the rule is the same as at Norwich.

Coming back, and going down the river from the latter city, it is difficult to mention the subjects which will photograph best. Every mile, however, is rich. The odd little vine-covered houses, with their gardens, form most charming foregrounds, and by using small stops they can be got fairly into focus. The river

bends, sharp hills beyond, with a middle distance often filled with quaint buildings, are some of the materials from which the pictures may be made up.

There are few localities within reach of New York city that will half as well repay an excursion by one of the photographic societies. It can be easily taken in two nights and one day.

It would probably not be feasible to tramp from New London to Norwich. But there is an early train up and several way-trains down, during the day, with a late train to catch the steamer. It would be easy to arrange to move the party from point to point without an undue amount of walking. There is ample material within walking distance of almost any of the stations, and both of the towns are rich in material for a party to work upon.

During a recent trip over the ground, we had so little time during two very dull rainy days that we could do little more than note the points from which we hope to obtain views at some future time. We were almost ready to believe that we had found a little world made for the especial pleasure of the amateur photographer.

Owing to the extreme dullness of the days upon which our visit was made, we are unable to give any important advice in regard to the time of the best lighting. The general course of the river is from north to south. The railway runs upon the western shore. From this, general conclusions can be drawn in regard to the best times for exposing for the more extended views. As the river is full of bends, there will be little difficulty in utilizing almost every hour of the day, providing there is sunlight.

ORTHOCHROMATIC PHOTOGRAPHY.

BY G. CRAMER.

[Read at the Washington Convention.]

As long as photography has been in existence, it has been the desideratum to produce photographs in natural colors; but while this problem is at present still far from being solved, one great improvement has been accomplished as the result of many scientific researches—that is, to produce photographs of colored objects in the correct gradations of shade, or what is termed “orthochromatic.”

It is a well-known fact that formerly this would not be done, and that in ordinary photographs of colored objects the violet and blue are reproduced too light, while green, yellow and red appear too dark. For this reason it is noticed in landscape photography that much detail is lost in the foliage, that the blue sky appears as light as the white clouds and renders the latter invisible; in portrait photography the auburn or red hair comes much too dark, the freckles much too prominent, and blue eyes, blue or pink dresses, etc., entirely too light. In the reproduction of colored paintings this defect is most objectionable, as the lights are often yellow in the original, and appear darker in the photograph than the half shadows, which are painted in bluish tints.

The cause of these shortcomings of photography has been carefully studied, and it has been found that only such rays of light affect the photographic plate as are absorbed by the salts of silver employed in the preparation of the sensitive collodion or emulsion. The bromide and iodide of silver absorb mostly the violet and blue, and little of the yellow, orange and red rays, when exposed to the spectrum.

Professor H. W. Vogel observed by his spectral analytical experiments that photographic plates can be made equally sensitive to all colors by adding certain dyes which enter into combination with silver and absorb those colors of the spectrum which are not absorbed by the bromide of silver, and his first experi-

ments in this direction date back to the year 1873, when he succeeded in photographing a piece of yellow tissue, decorated with a piece of blue ribbon, with coralline stained bromide of silver collodion plate. A yellow screen was interposed between the object and the lens. The dyes most employed were cyanin, fuchsine, naphthalin red, aldehyd green and methyl violet.

In 1874 Becquerel introduced chlorophyll and Captain Waterhouse the eosine or fluorescin. In 1879, Ives, of Philadelphia, published his chlorophyll process. Other eminent experimentalists, such as Schumann, Becquerel, Waterhouse, Abney, Attout, Clayton, Carey Lea, Dr. Eder, Swlik, Mallmann and others, added their share to the perfection of the orthochromatic process, and many dyes, mostly of the aniline group, have been employed to obtain the desired result, principally eosin in its forms as tetrabromfluorescein and tetraiodfluorescein, erythrosin, chinolin red and chinolin blue or cyanin.

The commercial dry plates can be rendered orthochromatic by bathing them in a solution of these sensitizers, but plates so prepared do not keep very long. It is better to introduce the dyes into the emulsion of collodion before coating the plates to secure better keeping qualities.

One of the drawbacks in working the orthochromatic plates is the necessity of using a yellow screen through which the light has to pass in order to subdue the violet and blue colors. Either a yellow-colored glass or a yellow pellicle made of colored collodion or gelatine is inserted in the place which the diaphragm occupies between the front and rear lens, the darker shade of the yellow screen giving the stronger orthochromatic effect, but also lengthening the required time of exposure considerably. The colored screen must be very perfect, of even structure and color, and as the focus of the lens is changed by the interposition of a yellow screen, the focusing must be done with the screen inserted, which, owing to the feeble light admitted through it, is rather difficult.

The idea that the yellow screen alone will give the orthochromatic effect, even if any ordinary dry plate is used, is erroneous, as the bromide and iodide of silver are but little sensitive to the yellow and red light and the effect of the blue will always be predominant in photographs produced with ordinary plates.

It is now the aim of the experimentalists to prepare orthochromatic plates in which the sensitiveness to the violet and blue rays is reduced to a minimum, and the sensitiveness to the green, yellow, orange and red increased to the highest degree, so that the use of yellow screens is rendered unnecessary, and I for myself can report progress in my experiments in this direction, so that I hope soon to be able to place on the market an orthochromatic plate of good sensitiveness which can be worked without a yellow screen.

(See discussion in the report of the Washington Convention.)

[From *Photographisches Wochenblatt*.]

MINIATURE PHOTOGRAPHS.

BY DR. A. MIETHE.

(Conclusion.)

I USE very thin plate glass, which may be provided with a very thin gelatine sizing, to which the film will adhere better and upon which the emulsion will spread easier. If the glass plates are too cold, the well known defects are obtained, which, on account of the low temperature, are not so easy to avoid as otherwise. The plates when congealed are placed in a well-ventilated drying box or closet, free from dust, to dry. If poured upon microscope covering glasses, the emulsion is measured by immersing a glass rod into the same to a certain depth, and thus letting the emulsion drop off on the covering glass. The coating can be very thin, as the emulsion covers pretty strongly.

Triäthylamin gives an uniform and finer grain than ammonia; if the emul-

sion is not left standing for a longer while before shredding (thirty-six to forty-eight hours) coarser grains and also a kind of defect is obtained, which will show as irregular large and dark spots after development.

For the development of these plates, which give also excellent results for diapositives, stereoscopic pictures and lantern slides, I generally use iron.

The developing solution is composed of the following:

I. Oxalate of potassium.....	300 grams.
Citric acid.....	5 "
Water.....	1,000 c.c.
II. Sulphate of iron.....	100 grams.
Sulphuric acid.....	5 drops.
Water.....	400 c.c.
III. Bromide potassium.....	10 grams.
Water.....	400 c.c.

For development is mixed (fresh):

Solution. I.....	6 parts.
" II.....	2 "
" III.....	1 part.

Before development the plates are put for one to two minutes in a bath of pure water. The tone is pure black, but brown tones can also be obtained in the following manner:

The well-fixed and carefully washed plates are immersed in a solution of bichloride of mercury (1:200) for five to ten seconds, and then after renewed washing in ammonia solution (1 strong ammonia to 15 parts water). An intensification can hardly be observed here; the tone is an agreeable sepia-brown. If violet tones are desired the washed plate can be chloridized in the known manner, redeveloped with citrate of iron and toned in the gold bath (chloride of gold, 1; carbonate of soda, 5; water, 2,000). If developed with hydroquinone instead of iron brown pictures are obtained, which will admit of a very handsome purple tone; but the covering strength of the emulsion will then be a little less. It may be remarked that gelatine plates are forty to sixty times more sensitive than albumen plates, and that this grain, if the plates were manufactured correctly, is so fine that a good microscope (which will enlarge one hundred times) is required to see it. The grain of the French albumen miniature pictures is still somewhat finer, but the gelatine grain is sufficient for all purposes. Sometimes it looks as if a coarser grain was now and then between the very fine bromide of silver grains, but such a microscopical dark grain has generally its origin from small air bubbles, which cannot be entirely avoided, no matter how careful you are. If not sufficiently washed the nitrate of potassium will crystallize in knotty forms, surrounded by a transparent halo. If the developer is applied more energetically than above mentioned, the plates will not fog, but fine black spots covering the picture can be observed, evidently grains of bromide of silver, which in consequence of their easy reduction, blackened also upon the glassy surfaces.

We come now to the production of the miniature photograms. As an original, a negative 12 x 16 to 18 x 24 centimeters serves. It is advisable not to use the original picture, but to make a duplicate negative in the camera, which should have the following properties: It must be glass-clear in the

shadows ; the slightest fog influences the results ; otherwise, however, the highest lights should be covered entirely black, the same as for a line-reproduction-plate. The middle tones have to be strong, but at the same time transparent. Such a negative is easily produced in the usual manner by long exposure and development with a very diluted oxalate developer. More suitable yet are very strong and clear collodion negatives. The apparatus consists of a small multiplying camera for plates 4 x 4 c.m., with six to seven objectives of about 12 mm. focal distance and provided with 60 c.m. long, square-edged wooden telescopic extension. This extension is made of thin boards glued together, and lined on the inside with black velvet, or it should at least be blackened. This long wooden box carries in front a groove into which the negative is placed, and whereby the box is closed in front. The edges of the negative are pasted up carefully with black paper, so that the light will pass only through the negative, and nowhere else, into the box. Another thicker and exactly fitting box surrounds the former, by which means the box can be extended to 1 m. 20 c.m., to be able to vary the degrees of reduction. Into the rear wall of this extension the multiplying camera has been inserted, light tight. I have used a small miniature camera, which was made in the optical institute of Professor Dr. Hartnack. It is entirely made of brass, the holder of hard rubber. The objectives, about whose construction I will speak later on, are seven pieces screwed on one brass plate, and they can be regulated in their mountings by a micrometer screw, so that all focal planes can be brought into one plane. This objective plate is connected with the plate by an extension tube, enabling to press the level front wall of the holder light tight on to the plates by means of two side screws. On the objective plate is screwed a prismatic guide, permitting the movement of the holder towards the objective to be regulated. The focusing, which naturally is very delicate with such short objectives, will permit the finest regulation by means of this screw.

A ground glass can of course not be used for the focusing of such fine objects, the grain of the glass being too coarse. Instead of the sensitive plate there may therefore be placed in the holder a piece of plate glass, scratched finely with a diamond upon the side towards the objective. The rear wall of the holder has an opening into which can be inserted a strong achromatic lens, with which a sharp focus is taken upon the fine marks made with the diamond upon the plate glass. If the micrometer screw is now turned until the image of an object is seen sharply with the diamond marks, the focusing is finished. In this manner the picture, which may hardly have the size of a square millimeter, can be sharply focused. If the objectives have now been correctly adjusted, all seven pictures will be sharply in focus. The lens is now removed, the opening is closed by a brass cap, the dry plate is inserted in place of the plate glass and exposed by opening the slide of the holder or a large cap which had been placed in front around the wooden case. The whole case is hereby directed towards the bright sky.

The objectives used by me are microscopic objectives with small opening. They consist of two separately achromatized plano-convex lenses, which, adjusted at some distance, turn both their plane sides towards the focus. In front of the first lens is a diaphragm of about 1.25 mm. opening, so that the whole system has a rapidity of about $f/12$. These lenses have, of course—corresponding to their construction—a pretty strongly curved picture field, but

this is of not much consequence, the center only being used. The delineation, which exists in the case of the single landscape, is for the same reason not observable. It is, however, clear that these systems are only temporary, and should be replaced, as the case may be, by lenses better suited to the conditions. An aplanatic construction, with an even picture field and a rapidity of $f/3$, might be recommended. This could easily be accomplished in such small dimensions.

Regarding the exposure general rules cannot be given. With a good light and white clouds I have exposed seven to ten minutes upon albumen-collodion and about the same time upon chloride of silver gelatine. My bromide of silver gelatine plates, however, require an exposure of only five to twelve seconds, according to the density of the negative. If direct sunlight with ground glass is used the exposure should be almost instantaneous, at most one-half second, but the direct sunlight is apt to easily give fog by the reflections of the wall surfaces.

After development the bromide of silver plate is cleared in an acid alum bath and fixed. After this it is washed under a faucet, and finally in distilled filtered water, whereby the adhering fine dust is removed with a camel-hair brush. To separate the pictures, of which there are seven on one plate, the gelatine skin can either be stripped after the well-known process, or if one proposes to have the film or its support one proceeds as follows: The plate is brought under the microscope, and the defective pictures, caused by faults in the film, scratching, dust, etc., are looked for. The plate is then heated carefully upon a metal support, putting on each picture a drop of Venetian turpentine, and a microscopic covering glass is laid upon the same. After cooling the plate is cut to suit the pictures, and the several pieces are fastened upon the lathe and are ground off with emery and oil to the desired size. Care should be taken in this operation that the turpentine does not become too soft to prevent the emery from penetrating under the covering glass and spoiling the picture. Water should also not be used in grinding, as this would soften the gelatine film at the edges.

I believe that with the aid of this description the process is easily executed by any practical photographer.

"RETOUCHING."

BY GUSTINE L. HURD.

(Read at Washington Convention.)

THE little talk I shall make here on the subject of working the negative will occupy but a few minutes. My purpose is simply to say a few words on what I consider the natural office of retouching, with some reference to the enormities with which it stands charged as practiced to-day.

I am glad that the journals have lately been giving this matter a wider attention, and that the management of this association has thought it well to bring it here for discussion.

Some of us remember when this baby was born, twenty-odd years ago, and how much it was thought to add to the resources of portrait photography. It was held as a secret in the town of Boston for a little time after its advent, and pilgrimages were made by ambitious men from outlying towns with a view to discovering the methods whereby such phenomenal work was produced. One asked to be allowed to measure the angle of the skylight; and another returned

to his own city and proclaimed that he had captured the idea. His watchful eyes had, during his call, caught sight of blue mosquito netting under the skylight, and he reasoned that the meshes corresponded to the stipple that appeared upon the print. This conjecture, it afterwards transpired, was not correct.

A while back I was present at a club supper where a gentleman read a paper on "Lying." The gentleman was a lawyer, and it must naturally occur to you that he would possess great familiarity with his subject. He considered lying under three heads: The natural liar, the artistic liar and the d——d liar. For convenience of illustration, and because of the close analogy of the subject, I shall make the same classification.

Natural retouching may be said to be such corrective work as will be unobtrusive—supplementing only the shortcomings incident to the process. Photography does not always render a face as we see it; and in order to bring the picture to as close a representation of life as possible more or less work is required to be done; and this needs no excuse. For instance: Either from a slight under-exposure or heedless development, your image lacks that soft blending of lights and shadows seen in nature; the lines are hard, and a general exaggeration of the defects of the face is the result. It may be said that the most direct and effective way to remedy this is to make another negative. But there are often reasons why you had better not; you may have secured such a fine pose, and withal so pleasing and unconscious an expression (which has eluded you in every plate but that), that it makes one weary to think of renewed attempts. Perhaps the proofs have been shown, and the sitter will have that and no other. Clearly, then, you must make the most of that negative; you must coax the shadows down, soften hard outlines, and try to make the flesh presentable. It is hardly necessary to say that when you have done your best, if you commend it to the sitter, it must be with some mental reservations regarding technical value. Still, retouching has helped you out, and made respectable what otherwise would have been wholly bad. Or supposing the exposure and development had left nothing to be desired, perhaps the skin of the subject has appeared upon the plate as an exaggeration of blemishes; or patches of color have assumed the form of depression. Such work as will correct this is surely called for. Or again, your sitter has a face full of angularities, which no lighting under heaven (unless accompanied by an over-exposure that will make it flat) can quite keep down to natural limits. Then the pencil is your friend again. Many people sitting in a light stronger than that to which they are accustomed will scowl a little. The expression can often be made wholly right by a little judicious softening of the lines in the lower part of the forehead. Perhaps the whites of the eyes in the photograph may appear darker than in nature, by reason of a tinge of yellowness, often noticed in persons of bilious habit, or the same result may be had from a congested state of the minute blood-vessels. Then it is very easy to bring back the relative whiteness by a few touches with the pencil.

Other illustrations of what may be called natural retouching will naturally suggest themselves to you.

Artistic retouching embraces all this and a good deal more. When elaborately done the entire face and even a part of the drapery has been carefully worked over; the modeling of the face has been conscientiously preserved, the lights and shadows blended, the skin brought to a soft, textury appearance; a tendency to fatness, when present, has been corrected, a high light strengthened here and there to give a little more pronounced effect, and a general bringing of the face into tone and value has been accomplished. I need not say that a negative worked in this way can only be done by an artist.

D——d retouching (if so emphatic an adjective may be used in this presence) aptly describes the treatment that a tremendous majority of all the negatives made in these days receive.

It is of the most heroic character, and when the artist in banged hair has concluded her labors nothing remains of the original negative but the outline. She

proceeds in free-and-easy defiance of all the laws that govern the production of natural objects in light and shade. All the characteristics of the face go down before her ruthless pencil; wrinkles disappear, depressions are made to rise up, delicate tracings of muscles are obliterated; and when all is done the eyes and mouth are the only features that remain intact, and they are so out of value with all that surrounds them that they appear like floating islands in a spherical sea of polished marble. I do not blame the retoucher—she works up to what is required of her, and what she is praised for doing; but this is the photographic portraiture of to-day. The highest ambition of the negative-worker is to finish to a smoothness that rivals porcelain; no thought or care for the modeling or all that subtle quality of rendering so vital to the likeness; no feeling for portrait effects—only a frenzy for a smooth, mechanical surface and a struggle for rotundity. It is useless to remark how worthless such photographs are in the eyes of all people of artistic feeling, or even to those who seek a likeness, or how degrading it is to photography. Nothing contributes more to remove us from a recognition as artists, about which there has been such a senseless clamor for the last few years.

The baneful effects of this ignorant and ridiculous work is recognized, I think, by all our best photographers. Adam Soloman, as far back as 1874 (when this monster was but a tadpole) deplored the practice of retouching. Rejlander, the great Parisian photographic artist, writes: "I think the practice of retouching the negative a sad thing for photography. It is impossible for even very capable artists to rival or improve the delicate, almost mysterious, gradations of the photograph. I consider a touched photograph spoiled for every purpose." You will notice that he does not qualify these statements at all, or admit that retouching may be employed in any case.

The President of this Association writes, in a recent contribution to a year book: "How often do we make negatives so nearly perfect, and so closely approaching our fancy, that but a few touches seem necessary to complete them? And we feel that if only those few touches could be properly made they would certainly be a 'joy for ever.' But, alas! they have only to go through the retoucher's hands to become a lasting reproach."

H. P. Robinson, than whom there is no better authority on either side the Atlantic, says: "A great deal has been said against retouching, and very little in favor of it; yet it is practiced to such an extent and carried so far that individual likeness is almost abolished."

Highly touched portraits used to remind us of wax-works or marble, but it has now passed that stage of untruth.

It seems to me that the best men on the other side of the water are more outspoken on this matter than photographers here, and as far as my opportunities enable me to judge, the evil has been greatly mitigated there.

Perhaps the worst feature of all is that the great mass of people here, old and young, want this bastard work. They have become educated up, or down, to it, and cry out at truthful, legitimate representation, "*Away with it!*" Particularly is this the case with persons past middle life. The unaccountable feeling seems to possess them that to grow old is shameful, and they clamor for photographs that give them young-old faces. He who panders most to this wretched vanity will be exalted in the market-place and by the fireside.

Well, what shall we do? The public have elected that a shining puff-ball is the *ne plus ultra* of photographic art; and the artistic world has decided that there is nothing so common and debased as portraits by photography. He who refuses to conform to the standard set up by the public will have to forego their orders. I know whereof I affirm, for I have tried it.

Still, there is a cloud in the sky, which, if no bigger than a man's hand now, is going to overcast the heavens by and by; and the parched and wearied soul of the true photographer will be made glad by the refreshing rain of appreciation. Already there are many people who are sick of this miserable misrepresentation, and the number might be greatly increased if men of the better class would drop their weak-kneed policy and work for the best results instead of

the most profits in the immediate present. Truth will prevail in photography as in all else.

I do not wish to be understood as inveighing against retouching, for we all know it is a great help when properly employed. Yet I am of the opinion that, taken as a whole, the photographs made in this country for the last ten years would have been infinitely better had retouching been unknown.

To the conscientious photographer, he who seeks to give present and permanent value to portrait work, the question of working the negative is a more serious and perplexing one.

Gentlemen, I leave its further consideration to you.

THE CHAUTAUQUA SCHOOL OF PHOTOGRAPHY.

BY PROFESSOR CHARLES EHLMANN.

[Read at Chautauqua on Commencement Day, August, 1890, by the Instructor of the School.]

"WE study the Word and the works of God," the motto of the C. L. S. C., now displayed in our amphitheater, describes most thoroughly the work done in Chautauqua, and by Chautauquans all over the inhabitable globe. The study of the Word has been followed by that of His works, and the fruit of our labor has become visible all around us.

We are endowed with perception, and our judgment has commanded us to examine into the forces of nature, to observe their effects, and to inquire into their causes, and by doing so we are awed by beholding the work in its entirety and in its every detail. We have learned to look into the construction of the minutest organisms, even those invisible to the unaided eye; we follow the course of celestial bodies with ceaseless attention, and their nature and composition has been revealed to us. Objects from the bowels of the earth, or the bottom of the ocean, unknown to mankind but a short time since, have been laid open to be studied, and we have become as intimately acquainted with our planet's atmosphere as with the growth of forest and field, or with the beautiful prairie flower. Strata of rock and alluvial formation have been opened to our view, the madly rushing waters of the cataract have been commanded to stand still, as it were, for the purpose of being examined, and of the form and construction of man more perfect and truthful representations are now made than can possibly be attained with brush or chisel.

What has aided us towards these marvelous attainments, and what assists in our efforts to look so deeply into the works of God that the most remote details of organic and inorganic beings are open to inspection and our diligent studies?

It is all accomplished by most simple means. A piece of glass only coated with a peculiarly compounded substance, and upon which the rays of the sun or artificial light reflected from a visible object is concentrated by another glass, ground in spherical form—in short, by the camera obscura and the light sensitive plate. We write by these means, produce pictures, or, as we say in modern language, we photograph.

Wonderful things have been done by photography in the abstract sciences, as in astronomy spectrum analysis is almost entirely dependent upon, and microscopy's absolutely necessary recorder is now the sensitive plate. To facilitate the study of natural sciences, of botany, biology, and a multitude of others, to learn more distinctly of nature's beauties and marvels, to better educate our eye and heart, Chautauqua has given to her students a School of Photography.

It is needless here to tell of all that photography, the "art-science," as it happily is now called, is able to accomplish. What can be or is done by the force of chemical and physical means enlisted to her service, you all are thoroughly acquainted with, and it is more to the present purpose to tell you of our modest institution, and how far we have entered into the ideas of popular instruction, and of the success the school has had to the present.

Our method of teaching is very much like that of the C. L. S. C., and the examinations of the students after the course of instruction is completed the same. Our work demands, however, more than reading or theoretical instruc-

tion: the student must practice, and ocular demonstrations are necessary in frequent if not in all cases. We have therefore established practicing classes here on these beautiful grounds in summer, and in winter, at the school headquarters in New York. Many students embrace the opportunity, and the results obtained are most creditable to the instructed and gratifying to the instructor. But many others, the majority of students in photography, are debarred from these benefits. Those residing on the Pacific slope, and others whose home is beyond the seas, can hardly be expected to come to our practicing classes from so far, and there are many who are prevented by the force of other circumstances to join. All these students receive instruction by printed lessons, and by communicating at regular intervals with the instructor. Numerically the corresponding class stands in the front rank, in accomplishments it is not second to either of the practicing classes, as the specimens exhibited before you will testify.

Our school work commenced only a few years ago, under very adverse circumstances, and has since gained largely in almost every direction. The first class, that of 1886, had only five students. The list of members of the school for the year ending June 30, 1890, has 157 names.

PROCESS FOR BLEACHING GLUE, GELATINE AND BLOOD ALBUMEN.

M. WIDMER, of Wiesbaden, adds to 100 parts of the material in a hot concentrated solution, 1 part of powdered zinc and 1 part of oxalic acid, stirring well and continuously, and keeping the mass hot. In this manner gelatine may be obtained more colorless than by any other method. The proportions of the zinc and acid naturally vary according to the color of the original material and the desired color of the product.

In the case of the albumen of blood it is necessary not to heat above 50 degrees C. to avoid coagulating.—*Moniteur Scientifique.*

OUR ILLUSTRATION.

OUR good friend, Mr. George G. Rockwood, again comes to our aid in illustrating this issue of the BULLETIN. With an experience of many years in the taking of pictures of children, his work in this direction is always interesting and worthy of attention; and the example that forms the frontispiece of this issue of our journal is no exception. The child figure is life-like and natural, and the dog's likeness is an uncommonly fine piece of work, as those who have attempted such subjects well know. The "Good Friends" is a happy composition, and will grow upon those who study it rightly.

ALBUMEN PAPER TARIFF.

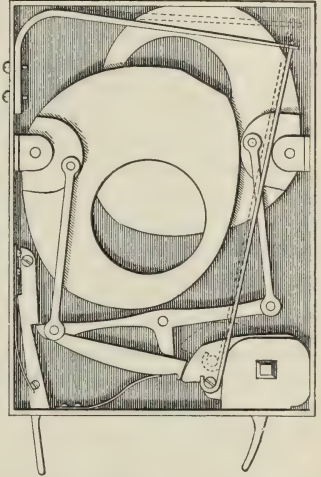
No doubt our readers will be greatly surprised to learn that the duty upon albumen and sensitized papers has been advanced from 15 to 35 per cent., especially after the efforts made by the photographers and members of the Photographers' Association of America, in an appeal through a circular to the members of Congress representing the several districts in which they reside. We consider the duty imposed oppressive and in the nature of a tax instead of a protection to an industry which the object of the tariff was to encourage. This act will bring hardship to many of our craft, but the superiority of the Dresden albumen paper will no doubt insure its supremacy among the photographers who desire to produce the best results.

TWO NEW SHUTTERS.

WE have lately had our attention called to two shutters of foreign manufacture, both of which are of such eminently practical value as to be deserving of notice.

The first is of Belgian make, and is intended to be fitted on the front board of the camera, behind the lens.

The entire mechanism depends upon having two disks so arranged as to pass by each other until the aperture of each is in perfect accord with the other, when, by a most ingenious application of the principles of leverage, the rounded cam which started the first motion (shown by white and dotted lines in lower right corner of cut), disengages from the lever with which it had previously been in contact, and simultaneously begins to bear upon the radial arm which works each disk in opposite directions, thereby reversing the motion until both disks have returned to their original positions. The shutter is reset by the trigger which works the cam, and released by the opposite trigger at left corner; a thumb-screw on outside of the shutter regulates the speed, which may be either extremely slow or of great velocity, with any intermediary speed as desired.

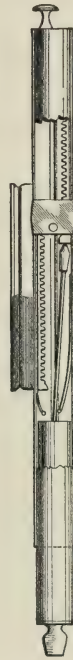
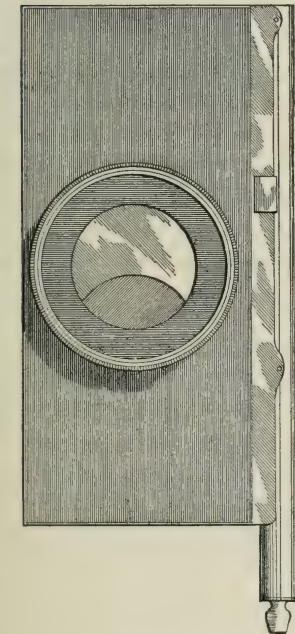


The other shutter is of French manufacture, and is worked by compressed air, which, being forced into the cylinder by pressure of a bulb, throws a piston against the end of a movable rack, which

engages with a stationary pinion, which is in turn engaged with another rack working in an opposite direction, as shown in the detailed drawing herewith.

Each rack being connected with opposite disks of the shutter, the result is a rapid passing of one aperture across the other, each time the piston rod is thrown up into the cylinder. A simple, but most effective arrangement of two small metal springs, attached to the racks, serves to throw the piston into contact with the two racks alternately, so that the shutter is always set.

The pulling out of a metal knob at top of shutter changes the movement from an instantaneous to a time exposure.



We have taken much pleasure in studying these two pieces of work, and hope their brief description will be of interest to our readers.

THE DAGUERRE FUND.

SUBSCRIPTIONS ARE STILL IN ORDER.

THE following is a partial list of the contributions to the Daguerre monument as far as we have received notice of them up to this date. We shall take pleasure in adding to this list as the names are sent to us. These are in addition to the money raised by dollar subscriptions :

Dr. A. H. Elliott, \$25 ; G. Cramer, \$500 ; E. & H. T. Anthony & Co., \$500 ; W. V. Ranger, \$10 ; W. G. Entrekin, \$100 ; C. H. Codman & Co., \$100 ; Benjamin French & Co., \$100 ; G. Gennert, \$50 ; Rhinehart (City of Denver), \$50 ; Sheen & Simpkinson, \$25 ; D. P. Thompson, \$25 ; L. W. Seavey, \$25 ; Hetherington & Coover, \$25 ; *St. Louis and Canadian Photographer*, \$25 ; S. J. Dixon, \$25 ; G. D. Milburn, \$25 ; Brodie Mfg. Co., \$25 ; John W. Morrison, \$25 ; D. R. Coover, \$25 ; Fowler & Slater, \$25 ; Catherine Weed Barnes, \$20 ; S. L. Stein, \$20 ; L. C. Overpeck, \$10 ; L. J. Ullman, \$10 ; Mr. A. J. Riddle, \$10 ; *Photographic Herald*, \$10 ; Ph. Bonte, \$10 ; J. R. Pearson, \$10 ; Baker's Art Gallery, \$10 ; F. E. Hastings, \$10 ; Buffalo Argentic Paper Co., \$10 ; J. G. Edgeworth, \$10 ; E. M. Estabrooke, \$10 ; Loney & Gable, \$10 ; E. J. Pullman, \$10 ; G. H. Van Norman, \$5 ; W. Stuber, \$5 ; E. Stanton, \$5 ; J. M. Brainerd, \$5 ; E. Fieger, \$5 ; A. W. Judd, \$5 ; Eddy Bros., \$3 ; G. L. Hurd, \$2 ; T. M. Mackey, \$1 ; J. R. Clemons, \$1 ; Bausch & Lomb Optical Co., \$20 ; J. M. Appleton, \$25 ; M. A. Seed Dry Co., \$100 ; R. H. Moran, \$25 ; Geo. Murphy, \$20 ; F. W. Guerin, \$10 ; Arthur, \$10 ; C. Gentile, \$10 ; C. W. Motes, \$10 ; Benjamin Brothers, \$5 ; Elrobora, \$5 ; E. Decker, \$5 ; S. B. Brown, \$5 ; Eugene Smith, \$5 ; F. Plotser & Co., \$5 ; M. G. O., \$2 ; Geo. Sperry, \$2 ; Adam Heimberger, \$2 ; Charles E. Craven, \$2 ; J. E. Smith, \$2 ; J. C. Fitzgerald, \$2 ; W. E. Eusten, \$2 ; W. Noel, \$1 ; L. M. Jackson, \$1 ; S. F. Sloan, \$1 ; A. M. Wiggins, \$1 ; J. W. Vance, \$1 ; A. M. Collins Mfg. Co., \$100.

In addition to the above Mr. G. L. Hurd, and Dr. A. H. Elliott, of the BULLETIN, collected subscriptions to the amount of about \$130, the names being handed to Mr. H. McMichael.

Mr. G. H. Hastings, of 147 Tremont street, Boston, contributes one-third of the gross sales of the unmounted groups taken at Boston.

Mr. E. J. Pullmann, of 935 Penn avenue, Washington, has made an excellent cabinet picture, also larger sizes, of the finished Daguerre monument, copies of which are before us, and every one sending him one dollar for the fund will receive a copy of the cabinet size.

THE BULLETIN is so valuable and so reliable that it is indispensable to every amateur who wants the best and knows how to appreciate a good thing when he sees it.

MARCUS H. ROGERS, Boston, Mass.

I HAVE been reading the BULLETIN for about twenty years. Although it originated in the dark ages of photography, it has proved a leading light to the profession ; and although we deeply mourn the loss of the great ones who have fallen by the way, and (thanks to the willing hands who have stepped in to fill their places) the great, noble, and generous souls—they have invented and improved for us, and led us through the wilderness, until to-day photography stands side by side with science and art. Long may the BULLETIN live and prosper.

P. ERSLEY, Texas.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.
and a corps of practical assistants.

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ROCHESTER CAMERA CLUB.

THE first regular meeting of the club this fall was held on the evening of September 19th. Owing to the inclement weather, but fifteen members were present, but these were amply repaid for coming. After the usual routine business, President Coughton introduced to the club Mr. B. J. Edwards, of London, Eng., the celebrated manufacturer of isochromatic plates. For over an hour the members listened to a talk on this subject which was of unusual interest. Mr. Edwards had with him a number of prints showing the vast difference between the ordinary and isochromatic plates in photographing paintings, flowers, portraits and landscapes. Among these were several prints of old oil paintings in the National Gallery which for years have baffled the photographer's art. The results were startling in their difference, ordinary plates hardly showing an outline in many cases, while his plates brought out most of the detail. Mr. Edwards recommended the yellow screen in photographing oil paintings, and sometimes with flowers, but ordinarily preferred not to use it.

Views of the Paris Exposition were then shown, which were admired by all. A vote of thanks was given Mr. Edwards, and he was

unanimously elected an honorary member of the club.

The club was indebted to their President, G. H. Coughton, for securing Mr. Edwards at this time.

Our enlarging lantern has been fitted up with larger condensers, and is now very complete. The Committee on "Illustrated Rochester" have nearly completed their work, and an exhibition will soon be made.

S. R. ADAMS,

Assistant Secretary.

THE NEWARK CAMERA CLUB.

THIS enterprising club had one of its annual boat excursions recently, and enjoyed an excellent outing. The course was over the Morris and Essex and Lehigh canals from Dover to Cherry Ford, and extended from Tuesday morning until Thursday night. The following gentlemen participated in this thoroughly enjoyable excursion: William A. Halsey, President; C. G. Hine, Secretary; T. A. Hine, Frederick T. Fearey, Charles Bassini, Paul Thiery, Seymour Tucker, H. C. McDougall, John L. Kuser, John Pfeifferle, S. J. Cullen, Frederick G. Agens, I. R. Denman, L. J. Brieth, James E. Howell, W. I. Powers and Frederick Duneka. All but four had cameras, and three of the number brought two cameras each. The plates were chiefly 4 x 5 inches, but there were two 8 x 10 instruments aboard, several 5 x 7, and a number of intermediate sizes.

PACIFIC COAST AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE regular monthly meeting of the Pacific Coast Amateur Photographic Association was held at their rooms, Merchant street, San Francisco, on Sept. 4th, the attendance being very large. Mr. E. L. Woods, the president, occupied the chair, and reported what had been done by the Executive Committee during the month, all the business of the association being now in the hands of the committee, and the regular meetings devoted entirely to photography.

Mr. George D. Dornin, an old pioneer of the State, demonstrated the daguerreotype process, and gave some very interesting reminiscences of photography in the mining camps in the early days of California. He was listened to with great attention, and some specimens of his work, nearly forty years old, but still perfectly preserved, were greatly admired.

It was announced that the association had secured the exclusive right to the windward

stake boat at the forthcoming State Regatta on the 8th inst, and had made arrangements to have it fitted up with dark rooms, etc. A tug to take the members to and from the boat had been chartered, and a good lunch would be provided.

The lantern entertainment of the evening was "A Trip to the Yellowstone Park," being a series of views of that most interesting country, kindly loaned by Mr. Sam C. Partridge, and described by Mr. Knight White.

GEORGE KNIGHT WHITE, *Secretary*.

POSTAL PHOTOGRAPHIC CLUB.

THE July and August albums, the former numbering nearly, the latter more than ninety prints, contain much worthy of study by those interested in photography, as certainly the club members are.

Miss E. T. Needles, E. H. Graves, H. Pulsford, send beautiful platinotypes.

In albumen Mr. Le Breton and Mr. Chase show portraits beyond criticism. Miss Bidle, scenes in Southern California, among which is the quaint old "Santa Barbara Mission." The lens work of Miss Clarkson's plain paper examples of still life is much to be praised, as is also Mr. Walmesley's microscopic specimens.

The club membership (thirty) reached its limits in June last.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

THIS society held its first meeting in its new quarters, at 113 West 38th street, on Tuesday, September 9th. The rooms have been most admirably fitted out, sumptuous dark rooms and luxurious library, making it a most attractive rendezvous for photographers. The meeting-room is large and comfortable, and on this occasion was decorated with some of the masterpieces of H. P. Robinson. The three pictures by Miss Barnes, illustrative of the poem, "Enoch Arden," added greatly to the interest of the exhibition, these being the ones sent in for the recent competition at the Washington Convention.

The meeting was called to order at 8.45 by President Stebbins. The President, in a short address, gave a concise account of the progress of the society since its commencement. He expressed his pleasure at seeing so large an audience, taking it as an indication of the interest felt by the members in the welfare of the society. It is difficult to realize how rapidly the society has grown and advanced. In April, 1885, the members' roll

showed a total of 93. Although the society was poor it was felt that more commodious premises were wanted, and rooms were fitted out at West 36th street, and the number of members increased to 136. A still further increase of members rendered still larger accommodations necessary, and rooms in the building of the Society of Mechanical Engineers were taken and partially fitted up.

Owing to a disagreement other quarters were looked for, and the present home of the society, at 113 West 38th street, was leased, and members could judge for themselves as to their suitability. By the untiring efforts of the New Quarters Committee the society were now in possession of the finest and best appointed rooms occupied by any society in this country, and probably in the world. Concluding; Mr. Stebbins earnestly hoped that the interest taken by the members in the society and in photography would still further increase, and that the time would come when, owing to increased membership, they would have to look for even larger premises.

The Secretary's report being read and adopted, Miss Catharine Weed Barnes read a paper describing her work in the preparation of the three pictures previously referred to. This paper will be found in another issue of the BULLETIN.

A vote of thanks to Miss Barnes for her admirable paper was carried unanimously.

Mr. Beach exhibited Bausch & Lomb's new model of their diaphragm shutter. In this the metal disks are replaced by gutta-percha, thus dispensing with the rust that used to interfere with the proper working of the shutter. In addition a timing arrangement is attached by which exposures from three to the one-hundredth part of a second may be obtained. Mr. Beach also exhibited Ford's print-timer, which had been presented by Mr. Ford to the society.

Letters were read from the photographic societies of Victoria, Australia, and from Boston, the former society offering to exchange 100 Australian lantern slides for an equal number of American views.

Mr. Burton presented a report from the New Quarters Committee, and made an earnest appeal for more new members.

The Treasurer's report was read and adopted, and a motion to transfer \$420 from the Special to the General Fund carried.

At the close of the meeting an interesting series of lantern slides were thrown on the screen, being a very pleasant termination to a most interesting meeting.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

WASHINGTON, August 13, 1890.

SECOND SESSION, 2 O'CLOCK P. M.

The Convention was called to order by the President.

President—The first thing on the programme this afternoon will be a talk from Prof. Thomas Wilson, Curator of Anthropology in this museum, his subject being "Types of Beauty." I take great pleasure in introducing Professor Wilson to you.

(Professor Wilson then addressed the Convention. See page 525.)

Mr. GENTILE—I move a vote of thanks be tendered Professor Wilson for his very interesting paper.

(Carried.)

President—A slight change in the programme is necessary, but it gives me pleasure to introduce Prof. T. C. Mendenhall, Superintendent of the Coast and Geodetic Survey, who will address us on the subject "New Metric Standards."

(Professor Mendenhall then addressed the Association. See page 527.)

W. H. H. CLARK—Did not this Association pass a resolution at a former meeting recommending this system?

Dr. ELLIOTT—It gives me a great deal of pleasure to speak upon this system. As a chemist, I use nothing else. I never think of using grains, ounces and pounds; they are too silly, too old-fashioned and life is too short. This system is easy, much easier than the old. At a former meeting of this Association a resolution was passed recommending the use of the metric system in forming all developers. Mr. Cramer took the trouble to have the system printed along with the old to aid in using it. The gramme is equal to one cubic centimeter (the speaker then repeated the table of apothecaries' weights). So there is five times as much to remember in the use of the old method. Furthermore, there are two or three different kinds of ounces in use in the United States with the druggists. I am connected with a college of pharmacy and have special reason to know this. There is much confusion in the use of ounces and no confusion in the use of the metric system.

Professor MENDENHALL—I would like to make my apology for the ignorance shown by me in regard to the acts of the Association. Recently, as the Superintendent of Weights and Measures, I published a set of tables for change from one of these systems to the other. It is not necessary when one becomes familiar

with the metric system; a study of tables is necessary until one becomes familiar with it. They can be seen at my office in Washington.

Mr. RANGER—I move a vote of thanks for the very interesting and entertaining address of Professor Mendenhall.

(Passed.)

President—We have promised you a talk upon "Posing and Composition." I now introduce to you Mr. L. G. Bigelow, whose face is well known to a great many of you.

(Mr. L. G. Bigelow addressed the Convention (see "Operating Notes," page 531), and in conclusion introduced Mr. L. J. Ullman, of New York, a professional artist, who gave a number of practical illustrations in posing—a young lady from the audience consenting to serve as model.)

President—Our next paper will be "Lighting," by Mr. E. P. King. It is desired that this paper, which will be short, be followed by some discussion.

(Mr. E. P. King read his article on "Lighting." See page 533.)

Mr. RANGER—I wish to extend a vote of thanks to these gentlemen who have volunteered illustrations and talks.

(Passed.)

A Lady—As a lady may I ask that the thanks of the Association be given to the young lady who helped us this afternoon?

(Passed.)

President—We will be glad to hear from any one who has anything to offer in the way of short talks on the subject of Mr. King's paper.

Mr. BOWERSOX—I would like to make one suggestion in regard to curtains on the outside of skylight. Make the curtain inside, away from the light, two or three feet from it.

A Member—If Mr. Motes, of Atlanta, were here, he would speak for himself about shading a skylight on the outside. He has it fixed with gas piping, at an angle of 45 degrees, the angle running out on the pipe screen 15 degrees. It gives it an immense and beautiful light.

Mr. HEARN—I would like to call for the experience of some gentlemen in regard to wooden blinds on the outside of the light.

A Member—I wish to ask if we understood Mr. King correctly when he said, in lighting strong lines about the mouth, that the Rembrandt lighting made a better subject? If so, my experience does not follow that line.

Mr. HEARN—He had reference to the lines along the mouth, not to the eyes, cheeks or nose.

Mr. L. C. BIGELOW—I gave up the use of outside blinds; they are unhandy and have too much machinery; the result is not equal to curtains.

Mr. RANGER—In speaking of screens on the outside of the light, Mr. Bigelow used an east light, but the west light would require the same treatment.

Mr. HART—I would ask Mr. Bigelow for his methods of lighting Rembrandts in profile with light drapery, etc.

L. G. BIGELOW—I place my sitter near the center of the skylight, parallel with the side light. If the subject is to be seen in profile, I work a little more toward the side light. The same head screen will accomplish two purposes: reflector in modifying the shaded side of the face, also to shade the direct light from the white drapery.

A Member—I would like to ask the gentleman if, in Rembrandt lighting, when he says the center of the skylight, if he means the center of the room or the center of the light center or further from the skylight?

L. G. BIGELOW—I mean directly in the center of the skylight. The idea is that in that position you get a soft light on the lighted side of the face.

President—Will you please make a drawing on the board to show this gentleman what you mean?

(Mr. Bigelow used the blackboard to illustrate his talks.)

L. G. BIGELOW—When we get a place to meet every year, and a light fitted up, everything being fixed for our use, we can give a practical demonstration of all. I will take the first twenty-five dollars for the permanent home.

President—During the past year I have been much pleased with the method of lighting, or the management of light, in which the curtains run laterally instead of up and down.

A Member—I have recently erected a gallery in which I put a top light about 18 feet; on the outside three sections of blinds 6 feet long; opened and closed by rods and ropes. You can make a cool, cloudy light in a few seconds of time. Mr. Bigelow probably has not used the kind I have used.

President—We have a paper on "Exposure," which will be read by title or otherwise, as you please. It is not very long. What is your pleasure?

L. G. BIGELOW—Let's have it.

President—Will Mr. McMichael please come forward and read the paper. (See next number.)

(After the reading of the article, the President called for discussion on the article.)

President—I want the names of all veterans here in this Convention, or in the city, so that we may have them ready for the Memorial Day. Please hand names and present address to the Executive Committee.

In regard to the excursion down the river, it has been thought best not to confine ourselves to an excursion of the Convention as a whole.

A Member—What is meant by veteran photographer?

President—Men who date back from the days of daguerreotyping—our old photographic fathers, the first in the business in this country.

A Member—What are you going to do with these fathers?

President—We will give them a little distinction that day. This being the memorial of the father of photography, we will give the fathers some honor.

(The President then called attention to the necessity of having the railroad certificates signed by the proper parties, if the members wished reduced fare home.)

This evening we have our art criticisms on photography, conducted by Mr. J. Scott Hartley, sculptor, (New York), illustrated with the stereopticon. I hope we will have a large attendance at 7:30 P.M.

It was moved and seconded that the Convention adjourn.

(Carried.)

————— EVENING SESSION.

7:30 P.M., August 13, 1890.

A pleasant entertainment on art criticism, by J. Scott Hartley, filled the evening to the satisfaction of a large audience.

Copies of forty-eight photographs, selected especially for the purpose of showing strong and weak points in posing, drapery, lighting, etc., were thrown upon a large screen and criticised by the eminent sculptor. Before each slide was shifted, questions were asked and answers freely given.

During the evening many amusing remarks were made from the dark corners of the room, and everybody seemed to enjoy the proceedings. The stereopticon arrangements were under the direction of Mr. T. W. Smilie, the museum photographer, and were very satisfactory.

—————
MORNING, AUGUST 14, 1890.

Fifth Session called to order by the President at 10.30.

President.—Owing to the illness of Mr. C. W. Motes, who was appointed as judge on the Grand Prize, I will appoint in his place Mr. G. L. Hurd, of Providence, R. I.

Mr. Ranger wishes me to say that the railroad companies have arranged to sign the certificates here.

The Secretary then read communications from the following named gentlemen: F. B. McCrary, Knoxville, Tenn.; J. B. Luttbeg, Mt. Vernon, N. Y.; G. H. Croughon, Rochester, N. Y.; E. T. Whitney, Norwalk.

[Letter from F. B. McCRARY.]

Whereas it is desirable to extend the practical usefulness of this Association, not only among the members of our Association, but among the art-loving public, we should do something to increase our membership and to bring out more active members at our annual meetings, and to create a deeper interest in this grand organization of ours. Let us do something that will attract the attention of all art-loving people. And to bring about this interest in our Association, Mr. President, I would like to make the following motion:

That this Association or the proper committee offer one gold and one silver medal for the best reproduction in oil; one gold and one silver medal for the best reproduction in pastel; one gold and one silver medal for the best reproduction in crayon. These reproductions to be made from cabinet photographs, and the cabinet photos to be the production of the photographer making the exhibit, the photographer having the right to make or have made his reproduction on any kind of enlarged print or without any.

The competitor to exhibit three pictures, sizes not smaller than 20 inches nor larger than 50 inches. The same to be neatly framed and the cabinet photo to be shown with the reproduction so that the judges can judge of their merit.

There should be three points of consideration:

First.—Likeness.

Second.—Artistic merit.

Third.—General effect of finish.

[Letter from J. B. LUTTBEG.]

Mr. President: I respectfully beg to submit the following points for discussion at your convention now in session:

First.—Is it not desirable to have a standard rule governing the number of sittings to be allowed to a customer without extra charge?

Second.—Is it not to the interest of the fraternity to have an understanding that no proofs shall be given on orders for less than a dozen?

Third.—Is it right, or just, or equitable in any sense of the word for the photographic stock houses to sell to the amateur at 20 per cent. off while allowing the professional only 10 per cent. on the same articles? I buy nearly all my goods (particularly Cramer plates) through an amateur who, because he happens to be connected with a large dry goods establishment, gets 20 per cent. In the words of Artemus Ward, "Why is this thus?" Ought not professional photographers to combine for self defence against such practices, and if they fail to get justice from the large houses, should they not endeavor to obtain for themselves, by co-operation, the advantages denied to them as individuals?

Fourth.—Is it not high time that that large and hard-working body—the photographers' assistants—made some attempt at organization with a view to bettering their condition? It is an acknowledged fact that photo retouchers of the highest skill receive only \$15 a week, while the same amount of skill displayed in any branch of organized trade commands \$22 or \$30 a week. If the photographer's assistant were in a position to demand adequate compensation for his work the competition between the small photographer and the photo factories would not be the unequal thing it now is. (By photo factories I mean all galleries which rely, not on the quality of the work put out, but on liberal advertising and club-ticket agents.) Indeed, those big commercialists—they cannot be considered artists in any sense of the term—would be the first to feel the influence of fair wages. Under the existing conditions, these people are nothing if not sweaters. They supply a wealthy or well-to-do public, at about one-third the proper price, with pictures which, if not the best, at least look fairly well, and bear the names of firms which the non-photographic public mistakes for names equal to Makart or Rubens; whereas if these large concerns were compelled to pay fair wages they would be unable to continue long the supply of even fairly good work at practically starvation prices. The small Cheap John is not the dangerous man; but the big Cheap John—the man who employs from ten to thirty men at half-pay.

(To be continued.)

THE difference between a temperance crank and a good swimmer is, one has water on the brain, the other brain above water.

Bibliography.

STUDIES FROM LEADING PHOTOGRAPHERS.

By C. Hetherington, Chicago, Ill.

THIS is a handsome volume, large quarto size, containing about fifty photo-gelatin reproductions of the best work of the most prominent photographers. The excellent selection of subjects and the care with which they have been reproduced make the volume a very desirable one for every photographer that puts an artistic touch into his work. We must congratulate Mr. Hetherington on his enterprise in getting together such a handsome collection of studies, which speak louder than words for his artistic ability.

LECONS ÉLÉMENTAIRES DE CHIMIE PHOTOGRAPHIQUE. Par L. Mathet. Paris: Société Générale d'Éditions, 24 Boulevard Saint Germain.

This is an excellent little manual of chemistry suited to the wants of the photographer. It is arranged alphabetically, and gives the preparation of all the important chemicals in use in photography and a description of the processes in which they are used, at the same time giving the reasons for their employment. It is clear, well written, and, as far as we have examined it, unusually accurate. It is a volume of over 700 pages small octavo, nicely printed and useful to every one who can read French and wishes to know anything about photographic chemistry.

PHOTOGRAPHISCHER ZIETVERTREIB. Von Hermann Schnauss. Düsseldorf. Ed. Leisgang's Verlag.

This is a small volume devoted to photographic pastimes and tricks, such as making photographs of crystals, lightning, flash-light pictures, fireworks, double-pose pictures, caricatures, ghosts, silhouettes, etc., etc. The directions are brief and to the point, and any one with a knowledge of photography will see the applications at once. The volume is full of ingenious ideas and well worth having.

ANLEITUNG ZUR PHOTOGRAPHIE FÜR ANFÄNGER. GER. Herausgegeben von G. Pizzighelli. 3 Auflage. Halle: a. S. Wilhelm Knapp.

This is a small handbook intended as an introduction to photography for beginners. It contains chapters on lenses, cameras and the other necessary apparatus, also discussions on diaphragms, exposure, development and printing. The fact that this is the third edition of the volume speaks well for its usefulness. To those of our readers who know

the German language we can recommend this book, as it is full of good, useful information and thoroughly practical.

TRAITÉ ENCYCLOPÉDIQUE DE PHOTOGRAPHIE.

Par M. C. Fabre. Paris: Gauthier-Villars et fils.

The various parts of this handsome work continue to come to us regularly. It is certainly the most complete treatise of its kind on photography yet published in any language. The care with which the matter is selected and arranged, the beauty of the typography and illustrations, render it an extremely desirable volume for the library of every photographer that can read the French language. We have before us the fifteenth part, completing the third volume, which leaves another volume to fill out the entire work. In the part before us we note a very full description of the various phototype processes (photo-printing from relief surfaces) including photo-electrotype, photochromotype, or color printing, photo enamels, and photogravure on glass. All of these articles are well written and fine monographs on the various processes.

THE MODERN PRACTICE OF RETOUCHING.

Sixth Edition. New York: Scovill & Adams Co.

This is a short description of the modern methods of retouching collected from French, German and English sources, and forms a useful little manual for those who are learning the art; but it must be remembered that retouching cannot be taught by books—the living teacher is essential. Nevertheless, those learning will find many useful hints in the volume before us.

LEHRBUCH DER PHOTOGRAPHISCHEN CHEMIE UND PHOTOCHEMIE. Von Alexander Lainer. Theil I.—Anorganische Chemie.

Instruction in chemistry applied to photography needs somewhat different methods from those ordinarily employed, and Professor Lainer, of the Imperial Institute at Vienna, has sought to supply this need in the volume before us. This part treats only of inorganic chemistry and begins with introductory matter about chemistry and physics, analysis and synthesis, and chemical combinations. Then follow chapters on the nonmetallic elements, such as chlorine, oxygen and their combinations. Following these we have a discussion of the properties of the various metals, and their relations to the various photographic processes. There are also chapters on the electrophotographic methods, such as electrolysis, photogravure, photo-etching, etc., by means of the electric current. The whole volume is written clearly, and with a view of using it as a textbook in the Imperial Institute; nevertheless, it is full of useful facts and suggestions for all who practice photography with intelligence.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—A. C. J. writes: Will you be so kind as to answer the following questions through the BULLETIN? How can I get the albumen out of my sensitizing silver bath without boiling it down? It seems to me there should be an easier way than boiling. After boiling it leaves the bath so yellow. Are there any E. A. lenses with 3 or 4-inch foci that will cut a $3\frac{1}{4} \times 4\frac{1}{4}$ plate, also price of same? What makes my ferrotype plates have a white scum on them after development? Will newly-made collodion do it? My bath is 40 grains strong.

A.—Make bath slightly alkaline, then add a small piece of kaolin (China clay), shake well and set in sunlight for one or two days, and the albumen will be deposited and the bath clear up. But you may heat the bath just to boiling instead of sunning, and the albumen will coagulate and may be filtered out; there is no need to boil down. Our publishers have sent catalogue of lenses. The scum on ferrotype is due to the silver bath; add more nitric acid to bath, carefully, until the fog disappears.

Q.—G. G. I. writes: Please answer through "What Our Friends Would Like to Know," the following questions: My silver bath is 60 grains strong and well neutralized with ammonia, but I have to fume two hours to make it tone brown or black, and then the toning takes about twice as much gold as usual, and about three hours' time, when I toned in fifteen to twenty minutes before. I had this trouble for about five printings, and every time worse. Does the gold become unfit for use? Does the albumen paper get too old? I use N. P. A., extra large paper, $20\frac{1}{2} \times 24\frac{1}{2}$.

A.—Use printing bath very slightly acid with chemically pure nitric acid, and try a slightly weaker bath, say 50 grains. The gold bath requires to be kept up in strength in order to tone rapidly, and the temperature should be just warm. Albumen paper keeps

many months without deteriorating. The following toning bath works nicely:

Gold chloride..... 2 grains,
Sodium chloride12 "
Water..... 8 ounces,

with enough sodium bicarbonate to make it strongly alkaline to test paper. You may also use borax instead of sodium bicarbonate.

Q.—McS. writes: Will you kindly inform me how I could get the simplest formula for making enameled photos on porcelain permanent?

A.—Flow the plates with Anthony's glacé collodion.

Q.—F. S. S. writes: In "The Ferrotypes and How to Make It," by Edward M. Estabrooke, 5th edition, you will find, on page 165, a formula for producing fine whites and rich velvety black without fog. Now, this formula has been tried, and it does not seem to be possible to make it work. Can you tell me how the tannin solution should be mixed? It seems, when the tannin is dropped in, it becomes like ink and doesn't show any precipitate. Can you help me any or advise me how to get this solved?

A.—The trouble is possibly due to the fact that the solution of iron is not saturated. Make a hot solution of proto-sulphate of iron and let it become cold; if crystals separate, it is saturated, and not otherwise. Care should also be taken that the tannin is pure. If it contains gallic acid (a common impurity) it will not answer.

Q.—D. H. M. writes: We have been using the same paper here for two years. Everything went all right until three months ago. During that time we have had trouble with toning, and it has been going from bad to worse. Now, I will give a full account and see if you can help us out. I have used bath 40, 45 and 50 grains, neutral, fumed from twenty to fifty minutes; used every kind of toning bath I could think of: borax, sal-soda, acetate of soda, Hale's toning powder, etc., with about the same result. They will tone a little slowly, then stop. Then we try a new bath, sometimes the same and sometimes another; by that time they are pink on the back and look toned, but by transmitted light they are brown. We made up a new bath (silver) 45 grains, took one-quarter of it and re-dissolved with ammonia, and added the balance to it and fumed forty-five minutes, and still they balked. The baths were all made up out of ice water. Used gold coin cut and evaporated, and also the chloride gold that comes in bot-

tles. The best tones we have had in a long time are by lime, chalk and lime water; and then, while the prints lie in the water so long waiting to be toned they become covered with a white coating of chloride of silver, I suppose, as if they had been at first immersed in salt water. Our water is considered very pure and it is clear and nice. Do you suppose it contains something that affects the prints during the first washing? When prints come off the negative they look fine.

A.—We cannot understand your trouble. Send us some of the prints both before and after toning, in envelopes that prevent the access of light. It appears to us there must be some slight irregularity with your toning bath. Try a toning bath made with distilled water and made just warm to the fingers, and take care not to use too much alkali in it. Let us know how you get along.

Q.—W. E. S. McC. writes: I have some ammonia nitrate fused, and have written you to find out its strength in comparison with ammonia nitrate not fused. Would you kindly oblige?

A.—There is no difference between fused and unfused ammonium nitrate, except that the fused nitrate may contain no water while the crystals may have some adhering to them. If the crystals are pressed dry between blotting paper they contain no water. Probably you mean to speak of some other compound.

Q.—F. C. writes: Can you tell me through the next issue of the BULLETIN where I can get a formula for making prints direct on opal glass by development?

A.—You can obtain opal dry plates that can be printed under a negative and developed; or you may use the wet plate process. See

"Silver Sunbeam," page 393. Another method is with collodio-chloride emulsion, made by our publishers. Write them direct about this.

Views Caught with the Drop Shutter.

WE regret to note the death of Mrs. ALBERT D. GATCHEL, of Birmingham, Ala., from typhoid fever. She married Mr. Gatchel only last January, and died September 28th. We tender all her friends our sincere sympathy, for she was admired and esteemed by a large circle for her many womanly qualities.

COLONEL V. M. WILCOX, President of the firm of our publishers, enjoyed the annual reunion and camp fire of his old regiment, the 132d Pennsylvania Volunteers, at Mauch Chunk, Pa., on September 17th last. These annual meetings of the regiment are a source of great pleasure to the gallant colonel, and many reminiscences are kept fresh in his memory by them. May he live long to enjoy many such reunions.

IN a recent issue of the BULLETIN was a note on the new eye-piece of the great Lick telescope. We now learn that this interesting and valuable addition to the instrument was made by the Gundlach Optical Company, of Rochester, N. Y.

WE regret to note the death, on September 22d last, of W. A. Hasbrouck, of the firm of W. A. Hasbrouck & Co., the photographic merchants and druggists, of Seattle, Wash.

MISS BLANDINA LANDY, the only daughter of our good friend, James Landy, of Cincinnati, was married to Mr. Samuel Wayland, of Chillicothe, on September 23d. It was a home wedding at the house of Mr. and Mrs. Landy, at Cincinnati, and was very largely attended. We wish the happy couple a long life together, and that their cup of joy will ever be as full as now.

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At the Forge.

ANTHONY'S Photographic Bulletin.

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MORE ABOUT THE REVERSAL OF THE IMAGE BY DEVELOPMENT.

SINCE writing about the production of "Direct Positives by Development," we have received some additional information upon the subject from Colonel Waterhouse, in the form of an addenda to his paper, in the *Journal of the Photographic Society of India*. The importance of this work, and the well-known standing of Colonel Waterhouse as Assistant Surveyor-General of India, lead us to believe that every advance in the process will be welcome news to the readers of the BULLETIN. For many years the Surveyor-General of India's office has been the birthplace of processes for the rapid and accurate reproduction of maps and charts by photo-mechanical processes, and there is no better work done in the world than that which comes from the department working under the supervision of Colonel Waterhouse. Since the new process for the reversal of the image in the developer saves the production of a negative, with its incidental dangers, the use of thiocarbamides for photographic development in reproduction establishments deserves the most careful attention.

Should there be a demand for the phenyl-thiocarbamides, the resources of the chemist are such that its present high price will soon be broken and cheaper methods devised for its production. In every case of this kind it only needs the stimulus of demand to sharpen the inventive genius of the chemical manufacturer. Chemicals that but a few years ago were made by the pound to be used in scientific research, are to-day made by the ton and for the use of the photographer. So will it be in the matter of phenyl-thiocarbamide.

In the addenda to his paper mentioned above, Colonel Waterhouse gives the following additional information in regard to the reversal of the image during development :

"It has been found that, for copying line subjects, it is an improvement to use the eikonogen and phenyl-thiocarbamide developer, and before developing to give the plates a preliminary bath of dilute nitric acid at 5 per cent., or of bichromate of potash about 3 to 4 per cent, the solutions being flowed over the plate in a tray and washed off quickly. By this means greater density is obtained in the lines, together with clearer whites. The reversal takes place slowly, but is more complete, and the change is quite visible, the lines turning black on a light ground. Greater clearness of the ground may also be obtained by treating the developed plate, before fixing, with a solution of bromide of copper of about 2 or 3 per cent., but the density of the image is liable to suffer.

The same treatment seems to answer well for half-tone work, but the difficulty is to get the correct exposure.

“Wratten’s ‘Ordinary’ plates work well in this way, and it would seem that less exposure is required than under normal circumstances.

“Working with thio-sinamine and eikonogen, good reversals have been obtained of half-tone subjects with a developer containing about 10 or 12 minims of a 10 per cent. solution of bichromate of potash to the ounce.

“For copying work the process as improved seems quite practical, and heliogravure plates have been successfully engraved from the reversed positives taken directly in the camera, by which one operation (either the taking of a negative or of an intermediate positive) is saved.”

For the benefit of those who may desire to experiment with the above process, we would say that the phenyl-thiocarbamide and the thio-sinamine are between \$2 and \$3 an ounce at the present time ; but the very small quantities needed to produce reversal of the image in development will bring the experiments within the reach of all interested.

Should any of our readers undertake to try the methods given by Colonel Waterhouse, we should be very much pleased to see some of the results. There is certainly a rich field open in the direction pointed out by the Colonel, and we hope many workers will enter it and enjoy the results that are obtained by all pioneers in newly discovered localities, be they the more common ones of mining, or the less common of photography.

EDITORIAL NOTES.

IN a recent copy of *La Nature* may be found mention of a new photometer invented by MM. Seguy and Verschaffel, which is patterned on the principle of Cook’s radiometer, only that the disk, being suspended by a silk thread and carrying an indicator of extreme sensitiveness by being placed in front of the camera, records any difference in light to a point as fine as the one-hundredth part of the light from a standard candle ; and in the same issue is also recorded another instrument of this same class, invented by M. Lion, which has for its basis the fact that equal surfaces of iodide of nitrogen, preserved under its mother liquor and exposed the same time to light of same intensity, will throw off equal quantities of nitrogen gas. A tube, to which is attached an index, connects two bulbs, the result being that, so long as the amount of nitrogen gas thrown off by each surface is equal, no effect is produced upon the indicator, but the moment either shows any increase over the other it is recorded. The instruments are both of a most interesting nature.

WITH the longer evenings and the approach of the winter season come news of increasing activity and interest from the many camera clubs and photographic organizations about the country. The Ridgewood, N. J., Camera Club opened its season last week with a reception at its new club house, and a most delightful evening was enjoyed by those who were so fortunate as to have been present. A large amount of work of its members was on the walls and tables as the result mostly of the labors of the summer just passed.

THE Hartford Camera Club is growing so rapidly as to require larger and better accommodations than were afforded by its previous quarters, and at a special meeting recently called for the purpose, a committee was appointed to secure a new place of meeting, which has been done, and the club expects shortly to be in the full enjoyment of its new rooms.

WE are in receipt, from Dr. George L. Sinclair, of Halifax, N. S., of three remarkable prints of wave studies made by himself. Dr. Sinclair writes that the negatives were made with an ordinary camera, held in the hand. The prints exhibit not only strikingly beautiful compositions, but an amount of detail which is truly wonderful, giving with almost equal truthfulness the detail in the breaking surf, the soft clouds overhead, and the somber, black, seaweed-covered rocks in the foreground. We congratulate Dr. Sinclair on being the artist of three such gems.

THE Photographic Society of Philadelphia is about to give an exhibition of about sixty of the noted views made by Mr. H. P. Robinson, of Tunbridge Wells, England. These prints are of a very large size, and the fact that they come from the hands of Mr. Robinson is sufficient guarantee of their merit. The exhibition begins on the 27th of this month, and continues one week, tickets being obtainable from members of the club. A late meeting of the society was made additionally enjoyable by the presence of Mr. John Carbutt, who spoke upon his recent trip abroad and the many improvements and novelties he saw on the other side.

It affords us great pleasure to note that the club of Amateur Photographers in Vienna is at present engaged in preparing for an International Photographic Exhibition, which is to be held at the Imperial and Royal Museum of Arts and Manufactures, from April 30th to May 31st next. The stipulations for entry are, in effect, simply that the work to be exhibited must have the true artistic value. An earnest appeal is made to all lovers of the art on this side of the water to contribute to make the affair a brilliant success. The only expense attendant upon exhibition is the carriage one way. It is hoped that some of our artist photographers will act upon this appeal, and send to Alfred Steiglitz, 14 East 60th street, New York, for circulars and full information regarding it.

A SERIOUS accident, which must always be guarded against, happened to Mr. Penn, a well-known photographer of India, not long since. He was in the act of opening a pound bottle of ammonia in his dark room when the contents spurted up into his face, seriously injuring one eye and badly burning his lips and tongue. This is an agent that should be handled with extreme care.

WE have before us a most excellent photograph of a group of gentlemen, made at the meeting of the Photographic Section of the American Institute at Glen Island, on the 4th of September last. Mr. Cornelius Van Brunt is the artist, and may well be proud of his effort. Many familiar faces are to be seen. Both the posing and composition of the group, as well as the wild and rugged background, combine to render the whole an admirable production.

IN an old fixing bath which was refined, it was discovered that an amount of silver had been deposited, equal to 184 grains to about 22 gallons of the bath, indicating that as many as 1,230 cabinet-sized plates must have been fixed in that one bath in order to have enriched it to the extent noted.

THE opening meeting for the season of the Milton and Mattapau Camera Club (Mass.) was held at the house of its Secretary, Sept. 30th, and officers elected for the coming year. John Locklin was re-elected President, E. Sonnenbrodt, Secretary, and Alfred Kircher, Treasurer. A lantern slide entertainment is in preparation, and the club is full of activity.

A CASE of considerable interest is now being tried in Philadelphia, where the plaintiff is endeavoring to recover damages for the death of her husband, who was killed by the explosion of "flash powder" while in the employ of the defendants; the plaintiff claiming that as the powder was explosive and dangerous, the defendants were negligent in not having warned the deceased of the fact. The defence claimed that he was instructed to use care on this account, and that damages could not be recovered, as this was simply one of the risks of employment. The decision in the case will be looked for with interest, not only by photographers, but by other manufacturers as well.

THE Boston Camera Club are enjoying the advantages of a new and commodious dark room which is perhaps as complete as any in this country. It is provided with lockers, hot and cold water, shaded electric lights, a spacious enlarging room and large developing closets, so that ten men may be amply accommodated, all at the same time. The club is not only full, but it enjoys the luxury of a large waiting list as well.

INTEREST in photography has culminated in the neighborhood of Paterson, N. J., in the formation of a club in that section, and we expect shortly to see it fully equipped and well started on the high road to success.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Increase of Silver and Platinum Prices.—Cheap Platinum Printing Process.—New Artificial Red Glass for Dark Rooms.—Keeping of Sulphate of Iron Solutions.—Photography and the Police.

THE price of silver and platinum has gone up, the former 25 per cent., on account of the silver requirements of Uncle Sam, who coins the same and hides it unused in his vaults at Washington; the latter about 150 per cent., so that the cost of a sheet of platinum paper here is at present half a dollar and more. Why is it that platinum has become so dear? Only in consequence of the great demand for incandescent electric lamps. They are so extensively used that the firm of Siemens & Halske alone consumes monthly 30,000 marks worth of platinum. The assertion would, therefore, not be out of the way that the monthly consumption of platinum in Europe will reach the sum of 100,000 marks. Therefore the increase in prices. Under such circumstances the plati-

num process has become very expensive, and efforts are made to produce platinum pictures in a cheaper manner. The simplest way is the well-known process by substitution. The print is made upon silvered paper, toned with platinum instead of gold, and fixed and washed as ordinarily. The process differs therefore but little from the common printing process. Only the toning process requires another salt and furnishes black pictures. Dr. Hezekiel here has a most durable silver paper prepared for this purpose at only half the cost of a sheet of platinum paper, and which indeed permits the production of platinum pictures at the former prices.

I have written to you before about the imperfect red glass for dark rooms. Lately some glass manufacturers have taken pains to produce a suitable glass, but a test made by me has proven that even that is still too transparent for green light. My son has now succeeded in producing a red glass for dark rooms in a different way. One gram of aurantia is dissolved in 100 c.c. of distilled water by application of heat. A few drops of ammonia are added if all does not dissolve. Further, 20 grams of gelatine are dissolved in 100 c.c. of water. After this 25 c.c. of the aurantia solution are mixed with 25 c.c. of the gelatine solution and filtered through moist flannel. With this colored gelatine solution clean glass plates are coated upon the leveling stand in a completely horizontal position, carefully avoiding air-bubbles. For a plate of 18 x 20 cm. 30 c.c. of above solution are required.

The plates produced in this way absorb the blue light completely, and are very suitable as glass for dark rooms in which wet plates or less sensitive chloride or bromide of silver paper is developed.

Sensitive bromide of silver gelatine plates and color sensitive plates must not be developed in this yellow light, because, as already stated, the blue light only is absorbed, whereas yellow, green and red have an unimpaired passage. To retain these, another coat has to be put on, which absorbs green and yellow. This is gelatine, dyed with rhodamin.

In 250 c.c. of water, 8 grams of rhodamin are dissolved. Further, 20 grams of gelatine in 100 c.c. of water; 25 c.c. of gelatine solution are then mixed with 30 c.c. of rhodamin solution and filtered through moistened flannel.

For a plate of 18 x 20 cm., 30 to 50 c.c. of the above solution are taken. If the glass is to be used only for the development of ordinary plates, 30 c.c. will be sufficient, otherwise from 40 to 50 c.c. should be used, the glasses still admitting the passage of some yellow and orange light by application of only 30 c.c., which by prolonged influence upon eosin silver plates may cause fog.

The rhodamin glasses produced that way can, of course, not be used by themselves, admitting, as already mentioned, the passage of the blue light unimpaired. But if they are combined with an aurantia glass, produced in the above described manner, a glass will be obtained which admits exclusively red light. It is best to put both plates with the film sides together (after drying), whereby any damage from liquids spurting against the same is excluded.

The glass plates can also be provided with a collodion sub-coating before coating with the colored gelatine solutions. The gelatine films can then easily be stripped from the glass after drying.

The colored gelatine films so produced would be specially suitable for tourists' lanterns in place of the ruby fabric at present in use, which admits considerable quantities of blue and yellow light. Unfortunately both coloring matters cannot

be dissolved together in gelatine, they having a mutual precipitating tendency.

How is sulphate of iron preserved? Professor Dr. Duner and Mr. Lindstrom answer:

The sulphate of iron solution should not be kept in the dark room, but at a window illuminated by the sun.

The correctness of this prescription is proven by the fact that ferric compounds are reduced by light, and are therefore kept always in dark vessels. Consequently, the developer compounds, on the contrary, should always be in a bright light. Dr. Duner left a sulphate of iron solution in open bottle in the dark for several days, until the same assumed a strong yellow color, and then exposed the same, well corked, to direct sunlight. Already after one hour the solution was almost colorless, only a little bluish-green, consequently quite free from oxide.

All who work with oxalate of iron should keep their stock-solution in a bright light, and put only a quantity in the dark room sufficient for daily use. By adhering to this prescription the sulphate of iron solution is just as durable as that of the oxalate of potassium.

A highly interesting work about photography in the service of the police is at present published by Gauthier Villars in Paris, "*La Photographie Judiciaire de Bertillon*," in which quite remarkable disclosures about the peculiar application of photography are obtained. It is not quite so simple as a good many may think.

We know that at all police departments a so-called criminal album (rogue's gallery) can be found; but we do not know that the prints contained therein take the photographer oftentimes to a hard task. The best photographer is not able to produce a photographic picture which is entirely satisfactory for all police purposes. The principal, or rather the sole purpose of the police, is to readily recognize the criminal. And how often is a picture, made on an ordinary plate, actually true and of infallible resemblance?

Lately the significance of police photography has been considerably reduced. Formerly it was the principal instrument of the "so-called" identification service, that is, the recognition of old criminals. But since the introduction of the anthropometric method it has taken a back seat.

The principal rule of this process is never to take one photographic picture, but always two, one full-face and the other in profile. The second rule is, never to retouch a picture. The necessity and significance of both rules can easily be understood.

The first and last property of a police picture—we might say its only property—must be the resemblance, a likeness without any coloration or æsthetic improvement. But the retouching is dangerous to the likeness. Spots from a defective manipulation are not only removed from the negative, but also wrinkles, moles and other defects of the skin which are natural to the face and offer evidently the most convenient and positive means for recognition. Even a badly shaped nose or ugly profile of the forehead can be modified so that the sitter himself is astonished.

This is of no service to the police picture. Its first rule is, strictest exactness. Just the disturbing warts, wrinkles and moles are of the greatest importance. Therefore away with retouching. This request of Bertillon, who is an

authority in judiciary photography, seems to be almost superfluous ; we hear every day that it is disregarded by photographers ; even in this case they can not or will not conceal their artistic vanity and jealousy.

They desire to furnish handsome prints, but at the same time counterfeit the pictures in a lamentable manner. The pictures, on the other hand, are not made always in the same gallery, not always in the same position, under the same light or with the same apparatus, and experience teaches us that the slightest change of any of these factors is sufficient to deceive sometimes the shrewdest detective.

Other disturbing influences are to be added : change of whiskers, hair, expression of the eyes, which, under the influence of will-power, may have the most different lustres ; also physiognomic disturbances caused by sickness, wounds, vice, certain miens, caused by habit, etc.

This is the reason why two photographic pictures of one and the same individual, taken at intervals of only a few months, show oftentimes such a considerable difference that even experienced officers doubt their identity.

The ordinary photographic picture is, therefore, insufficient for judiciary purposes, and the actual police picture commences when this ceases. It has its particular rules and laws, and has been cultivated during the latter years to a particular art.

The police photography has to satisfy only one purpose, but it has to adhere to it ; to be recognized easily and certain by the officers, the witnesses of a crime, the relatives and friends of the defendant, and finally of himself, whose involuntary restlessness and stubborn dumbness towards his faithful image may be psychologic indications of the greatest importance.

In case of doubt, says Bertillon, no hesitation should be betrayed before the person in suspicion, and it is better to feign complete safety and hold the picture in question before his eyes. No rule being without an exception : If the photographic picture is his own, he cannot help looking at it for some time, to find points of unlikeness. If it is not his own picture, and you have been misguided by similarity, your subject, who knows exactly where the difference is, will not hold it worth while to study the picture to prove your mistake. One look is sufficient for him to convince himself of the change.

The ordinary photographer does not trouble himself about this. It is sufficient for him if the picture is handsome, clean and flattering.

There is therefore likeness and likeness. There is a likeness which adheres preferably to the expression of physiognomy, that tender mimicry which rests like a veil over the face, which reproduces the instantaneous state of mind and emotion, indicating on the dial of the human face the relative barometrical conditions of life.

This is the likeness always pursued and sometimes reached by the artist, which he strives to take hold of in long sessions, while he zealously studies his model, trying to become familiar with its features, to condense the medium expression to a distinct conception, the medium expression which renders the individual type in the most lively manner. Extremely changing, this likeness takes other forms day by day, with nervous people from hour to hour, freakish like the weather with rain and sunshine, with the wind and the thunderstorm in the heavens, with the occupation of daily existence and the relaxation of idle hours. How much more after some dramatic occurrence, after guilt and crime !

This likeness, which might be called the artistic, sentimental or impressionistic, may have its judiciary significance, rendering a full personification, his general habits and the synthetic appearance of the man. It leads to sudden recognitions and gives us the sensation : I have seen that man once before. The police can also not be without it. They will, therefore, have a full face portrait taken which renders this kind of likeness. But, to be more exact, they take this picture not quite full face, because the nose would be shortened too much thereby, but about three-quarters, so that the exact lines of forehead, nose and ear still appear.

The other likeness is not artistic any more, but mechanical ; not sentimental, but anatomical ; not impressionistic, but geometrical. It proceeds from a comparison of the lines of the face, the curvature of the silhouette ; it is therefore rendered in profile. Will power or emotion will make only an insignificant change in this view of the face. For this reason the police will always make two portraits : a full face and a profile picture. In England these two are united by placing the subject before a suitably arranged mirror. While the full face picture gives, so to speak, only a panoramic view of the physiognomy, but which is full of expression and life, the profile picture, with its lights and depths, curves and straight lines, which in their rigidity let the picture appear as if crystallized, gives the mathematical configuration of the face. No actor, no matter how good a mimic, can change his forehead, nose and chin. The full face, known or unknown, may be distorted by cunning tricks or wild passions ; the silhouette will always remain alike.

The profile likeness is not so well understood by the public, for the simple reason that in reality a man is seldom looked upon in that position. If some one talks to us we do not study the geometry or anatomy of his features, but the expression from his eyes and manners. But the profile likeness is, in the hands of those who comprehend it, a true process, although it dissolves a physiognomy more in its single parts than to render the whole.

We can imagine that criminals have very little inclination to place their picture into the arms of justice. They know for what purpose their picture is taken, and will distort their features as much as they can. But it is of no use. In the instantaneous photography we possess the means to photograph the subject in an unguarded moment and at a time when he suspects nothing. The application of the magnesium flash-light will thwart the art of the shrewdest criminals to deceive the artist about their features.

BERLIN, September, 1890.

PREPARATION OF NITROCELLULOSE.

GUN-COTTON—PYROXYLINE.

BY P. C. DUCHOCHOIS.

IN a recent number of the *BULLETIN* Mr. F. E. Payne states that, in trying to make soluble gun-cotton by a certain formula, he succeeded in making nothing, and this, no doubt, for want of a definite formula and instructions to operate by the same.

The preparation of gun-cotton is simple, however, and presents no danger whatever, except that of breathing the acid fumes if the proper cares are not taken. As to explosion, none can occur,

In making gun-cotton one should bear in mind that the gradual addition of water to a strong solution of nitro-sulphuric acid—such, for example, as used to make the explosive compound—causes the formation of soluble nitrocelluloses, varying in their chemical constitution and their physical properties, and, by excess, causes the solution of the cotton wool or other materials in the weakened nitro-sulphuric acid. The action of heat should also be taken into consideration, for an acid which gives an insoluble product in the cold yields a pyroxyline perfectly soluble if prepared at a high temperature. The influence of heat also imparts to the product the property of forming a collodion which, when applied on a glass plate, dries in leaving a film quite structureless, which is important in photography.

The trinitro cellulose employed under the name of gun-cotton for military and blasting purposes, and in photography to inflame magnesium as originally devised by Dr. Piffard, is insoluble in a mixture of ether and alcohol, but soluble in ethylic acetate. It is prepared by immersing for twenty-four hours dry cotton wool in a mixture of three parts by weight of sulphuric acid, sp. gr. 1.84, and one part of nitric acid, sp. gr. 1.52. The action of the acid on the cellulose is almost instantaneous, but superficial at first; and in order that the films be acted on through, the cotton should remain in the liquid for the time specified.

During the transformation of cellulose into the nitro compound, water is formed and weakens the strength of the acid, which then can only be employed for preparing the soluble cotton by still weakening it with a certain quantity of water, which is easily ascertained by a few trials.

The cotton should be immersed by small tufts, taking care to press each one against the sides of the vessel with a porcelain spatula in order to expel the air, and well impregnate them with the acid so as to prevent the decomposition of the product, which in this case dissolves with evolution of red fumes, nitrogen peroxide.*

When the chemical action is effected the product is removed into a porcelain sieve, and when the acid is squeezed out, it is thrown in a large tub, where it should be rapidly spread out, then thoroughly washed under the tap until blue litmus paper, squeezed in the drained mass, shows no trace of acidity.

As the cellulose fiber is a hollow cylinder, and therefore mechanically retains traces of nitro-sulphuric acid, no matter how well the cotton has been washed, it is advisable to immerse it for an instant—the nitro cellulose—in a very dilute solution of ammonia, or, better, of sodium bicarbonate, and to afterwards rinse it in two or three changes of water, when it is squeezed in a piece of flannel, picked out and allowed to dry spontaneously.

The gun-cotton thus obtained is the trinitro cellulose. It is slightly yellow, but less liable to decomposition than when the treatment by ammonia or sodium bicarbonate is omitted. The yellowness is without importance.

The soluble nitro-cellulose—pyroxyline—employed to make collodion is not a definite compound, but a mixture of several soluble varieties. It can be prepared by either of the following formulas, devised and published years ago by the writer,† and which were lately recommended by Dr. J. M. Eder. The

* This is most likely the chemical action which caused Mr. Piffard not to succeed; moreover, the acid mixture employed by him was too weak, as shown by the solution of the cotton which at first took place.

† Anthony's Photographic BULLETIN, Vol. IV (1873), pp. 325, *et seq.* A good collodion process is described in this number of the BULLETIN.

first one is the most economical; for photographic purposes the formula *b* yields perhaps a more suitable compound.

(a)—Sulphuric acid, com. 66 degrees Baumé.....	5 pints.
Nitric acid, com. 41 degrees Baumé.....	4 “
(b)—Saltpeter, pure and dry	1 lb. av. dup.
Sulphuric acid, com. 66 degrees Baumé.....	26 fluid ounces.
Water.....	1½ “ “

Mix in a porcelain mortar heated to about 125 degrees Fahr. by means of boiling water, and when the temperature of the mixture is stationary at 150 degrees Fahr., immerse as much cotton wool as the liquid will cover, and then let the chemical action proceed for a period of ten to twelve minutes, keeping the temperature at about 140 degrees Fahr. during the operation, otherwise proceeding as above directed.

For photographic use—and indeed for keeping—it is absolutely necessary to eliminate all traces of acidity by sodium bicarbonate, moreover the acid retained in the fibers causes more rapid chemical changes in the constituents of the collodion. This the writer pointed out as far back as 1853.

[From Photographisches Archiv.]

THE RESTORATION OF EIKONOGEN THAT HAS BECOME BROWN.

An evil complained of a great deal in the development with eikonogen is the circumstance that the eikonogen will change soon, if proper care is not taken; that is, it will become brown and be useless for developing solutions. We have been asked the question repeatedly: Can eikonogen, after it has become brown, be restored again so as to be fit for use? and in view of this really favorite developer, it will certainly be of general interest to discuss this question a little closer.

It may be remarked beforehand that it is possible to make the changed eikonogen useful again, and in different ways. For instance, by the following process: Prepare a not very concentrated solution of sulphite of soda and add to the same one-half the weight of eikonogen to be so treated. If the solution is alkaline it is neutralized and made to boil in a glass flask. After this the rest of the eikonogen is added and the cooking is continued until the eikonogen is completely dissolved or nearly so. In the beginning only enough liquid should be taken to make the solution saturated; it is also good if a little of the eikonogen remains undissolved. The proportion may, for instance, be 500 c.c. sulphite solution to 90 to 100 grms. of eikonogen. The solution is then cooled off quickly by stirring it with a glass rod to accelerate crystallization. A powdery deposit will form, from which the colored liquid can be separated by decanting. This deposit is finally washed with alcohol (cold) and dried at a moderate heat.

In this manner an almost colorless product is obtained, which is applicable again for developing solutions.

For the practical photographer this process is somewhat complicated. We recommend, therefore, a trial of the following method by A. Pétry, which is much simpler:

Dissolve the brown eikonogen cold or with application of heat in the proportion of 20 grams to 500 c.c. of ordinary water. If warm water is used the

solution should cool off. On the other hand dissolve 50 grams tartaric acid in 1 liter of ordinary water. Of this solution take 150 c.c., and pour the same gradually (4 to 5 c.c. at once) into the eikonogen solution under continual stirring with a glass rod. The solution, which in the beginning is of a dirty dark-red color, assumes gradually a garnet-red color. It thickens very quickly and has then the appearance of a slightly light-pink colored paste. This is put into a glass funnel with a sufficiently large paper filter. The discharged water is of a more or less intensely red color, according to whether the eikonogen was more or less changed. If a few cubic centimeters of the above tartaric acid solution are added to this liquid, it will darken and form a new precipitate, which is filtered. The precipitate is then washed several times with the rest of the tartaric acid solution and left to drain. Finally the filter paper is removed from the funnel, spread upon two or three sheets of blotting paper and left to dry in an airy place, which should not be too light.

The whole operation is finished in thirty minutes, and all the apparatus necessary is generally in the possession of every photographer.

The dry deposit can be easily removed from the filter paper, and has the shape of fine scales of a pinkish color, does not change in the open air, cannot be dissolved in water, but is easily soluble if sulphite of soda is added to the water. The crystallized scales are easily reduced to powder by a light pressure. To save time in making the developer the powder may be changed to pellets, each pill containing 1 grain powder.

Mr. Pétry calls this product very appropriately "oxide of eikonogen." The question, whether it pays to change the original eikonogen with another product, he answers decidedly in the affirmative. It is not only in case of need practical, he says, but the oxide of eikonogen has also always the advantage of dissolving cold completely in water containing sulphite of soda, and that there is no weighing and no heating required by application of the same in the shape of pellets of a definite weight.

Pétry gives also the following developing solution :

Sulphite of soda (pure).....	30 grams.
Oxide of eikonogen.....	5 "
Carbonate of soda.....	50 "
Water.....	500 c.c.

The sulphite of soda is at first dissolved in water, the oxide of eikonogen is then added, and after it has dissolved, the carbonate of soda, reduced to a powder, is added. The bath, even in an open tray, should keep well for several days and give well colored negatives with good details. In case of necessity, a few drops of a 10 per cent. bromide of potassium solution may be added.

We remark, finally, that the above-mentioned precipitate can also be obtained with muriatic acid, sulphuric acid, nitric acid, etc., in place of the tartaric acid.

The so-called "oxide of eikonogen" is a misnomer. The precipitate is the amido-betasulphonic acid of betanaphthol. A better name would be acid eikonogen, since it is such, and may be made from any eikonogen by precipitating with an acid as above stated.—EDS. OF BULLETIN.

ADVICE FROM ONE WHO HAS BEEN THERE.

BY S. H. NUTT.

MUCH has been written, more has been said and considerable done, regarding films; but where stands and what says the professional photographer on the subject? Having studied the subject from all points, he reasons with himself about as follows: Now, I use the art of photography as a business, a means of earning a livelihood (and more, if possible), and what or which of all the modes of producing the counterfeit presentment of life and nature will be the one that, first, will be the most certain of success; and, secondly, the most economical?

In looking over the various articles that are advertised, pushed under my nose, almost squeezed into my pockets by the various parties who delight in supplying the needs of the business, I find that each one presents his apparatus, etc., in glowing colors as being by far the best and much superior to that sold by the man around the corner. One declares that the Squeedunk dry plate will work fully one-fiftieth quicker than the Toodle plate, that the "Spider-leg" tripod is much stiffer and more rigid than the "Spindler," and so on. Around the corner they reverse the situation completely. Each one can prove his position (so he says), but where is the beginner to place his trust. Too often he relies on the one who advertises in the largest type, and, of course, in purchasing from such, supplies fuel for further and more extensive advertising to bring other beginners to the net. Would it not be the best plan for such party to consult some old established professional, state his needs, and get from him the name of a good reliable house who deal in the goods and have an established reputation—a house that not only guarantees its outputs to be and do everything claimed for them, but be ready to prove to one and all that such is the case? As regards quality, of course such will be governed by the size of the pocket-book; but I will say one word right here, and that is, if you buy a lens be sure you get a good one. Never skimp a dollar or two (or twenty), as the greatest part of all depends on this. If you have made up your mind that you must spend only a certain amount for your outfit, shave anything but the lens.

Next, as to what to use for the negatives.

Various substitutes have been tried for glass to endeavor to secure lightness and compactness, used both flat and in rolls. Experiences vary, but having hunted in vain for a professional who uses the rolls, to depend on them for his success, I would merely say to those who think of investing in such, "Look before you leap." It is like following the "Will-o'-the-wisp," and you must, comparatively, "go it blind." Like in many other things, the theory is perfection, yet if such were one tithe as nearly perfect in practice, the professional would use and advocate them for certain work where weight came largely into question. As regards price, it costs considerably more to use the rolls at present prices than the finest dry plates supplied by about 15 per cent. If you wish to use only part of a roll and develop such, before finishing, you lose a certain length necessary to again attach the film to what they call a take-up-roller. Again, suppose you have used up the larger part of a roll, and desire to go out with more than you have left unexposed: you remove the partly used roll, and it is laid aside for some future day. How often will such future days arrive, and when will you use such piece, perhaps one-third or one-quarter

of the entire roll? And, not least, if one was on an excursion with one hundred lengths of exposure on a roll, is it not a great temptation to shoot at any and everything one sees? The careful photographer, with his twelve or twenty-four plates in double-holders, knowing just how many he has, uses greater care and discretion, and without doubt returns with, say, eleven out of twelve, or twenty-two out of twenty-four exposures, all good and excellent negatives (we have known of only four failures in two hundred and eighty-eight exposures), while the roll of films shows perhaps one-third that are desirable, many being duplicates or uninteresting. Now foot up the expense:

Two dozen 4 x 5 dry plates, at 65 cents.....	\$1 30
Developing same (by the party who exposed them).....	25
Forty-eight aristotype prints.....	1 80

Total.....	\$3 35
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CONTRA.

One roll forty-eight 4 x 5 films.....	\$3 00
Developing roll and printing forty-eight pictures.....	\$10 00
Less cost of film.....	3 00 7 00

Total.....	\$10 00
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As regards which is the more satisfactory result there is no question, as with the brilliant aristotype paper one can print from his own negatives, and the single toning and fixing bath, where all is done in one solution, simplifies the operation, making it almost child's play to produce as many beautifully toned pictures as desired, and besides this single solution admits of producing any tone, from warm sepia to regular black. If the party desires to have the developing and printing done by other than himself, he can readily do so and still have saved considerable; but development is so simple that every one should acquire a knowledge of this most charming part of the operation. As the plate is placed in the tray the developer flowed over, how earnestly we watch for the lines to appear, and when they do come up, gradually becoming more distinct until the entire details of the scene are before us in cream-colored lines, how joyously we recognize everything as it appeared to us in nature, and we glory over our success. Then as the negative becomes sufficiently developed and we wash and plunge it into the hypo, we turn for another and still another, and when all are finished feel repaid for our day's work. Should it be, however, that through any accident or carelessness we have made failures, we can reload our holders ourselves, go over the same ground the next day and again strap our camera and say: We not only "press the button, but do the rest, and glorious it is." On the other hand, we send our camera, roll and all, to a distant point and await our turn, not knowing what may be the results until it is returned to us, and then we find we did "press the button" (which means turn the crank, pull the string, and then press the button), and they have done the rest, and we have paid a good price for having them do it. Dry plates can be bought, and good ones, in almost every city in the world, and there is no necessity for any traveler to come away from points of interest without having secured good negatives of such, and I would therefore counsel any who may wish to secure a camera, to be sure he selects one that will accommodate plates that can be had at the thousand and one cities, and

not confine himself to such as require one special article, and if supplies cannot be readily obtained the instrument rendered practically useless. When shall we have a transparent film that will absolutely take the place of glass, be of sufficient body to keep it from curling as small as an ordinary lead pencil when it dries, and at a price not more than that demanded for glass? Have we no one in this wide-wide world who can solve this problem? Even at an advance in price of glass it would be a boon. I do not want it in rolls. It should be flat, as there are double holders made for such, so thin and light that they occupy small enough space. I am ready for something to use in them. I would rather come back from a tramp with twelve first-class well selected pictures than several times the number of uninteresting subjects. There are many celebrated haunts where six good pictures will show the entire beauty of the place much better than more that are ground out in the hand organ style. Where one secures twelve good exposures in a day and reloads his holders at night, his exposed plates are carefully packed and labeled with any necessary notes about time, scene, etc. If desirable to develop any one plate that may be in doubt, it can be done without disturbing the rest, and no one who values his results should ever leave an interesting spot without being sure of what he has done. I know of one party who made quite a long trip and exposed several dozen plates, and on his return found that his teacher had forgotten to tell him to draw the slide before removing the cap. To sum up there is one saying to remember before buying the outfit, viz.: "Be sure you're right, then go ahead;" and I will add that if one always goes right, he will never be left.

EXPOSURE.

BY T. C. HUSTON.

[Before the Washington Convention.]

PERHAPS this paper should be prefaced by an apology to this august assembly; but since it is written by request of your worthy President, let all the consequent fatigue be charged to him. It is not with any hope of materially increasing your information on the subject of exposure that this is written, but rather to provoke discussion, so that your undivided experience may be added to the general fund.

No point is of more importance, on few have we less tangible knowledge. Under, over, correct exposure are purely relative terms based on a dozen independent variables. Let us set out in order some of these elements. Of the conditions beyond our control the chief is the light. This is modified by the season, time of day, condition of the atmosphere, etc. The annual curve of intensity reaches its maximum about the last of May. There is then a slight depress, after which it remains practically constant until September, thence a uniform decrease until January, with nearly uniform strength until March, with a maximum about the last of January; after March an accelerating curve until the maximum. Maximum is about four times the minimum. The falling off in June is due to the suspended dust in the air during the summer months.

Neglecting refraction, the diurnal variation is theoretically in direct proportion to the altitude of the sun; but in practice I find that the sun's intensity on a clear June day increases slowly from dawn until 8 A.M., more rapidly until 12, remaining nearly constant until 2 P.M., with a maximum at 1 P.M. After 2 P.M. the light decreases rapidly until 4 P.M., thence more gradually until dusk. Maximum intensity is about twice that at 8 A.M. and 4 P.M.

If the sky be obscured by clouds the light is weakened more or less according

to the density of the vapors, light gray clouds making very little difference, while storm clouds sometimes destroy the light for studio use. At noon clouds without rain frequently increase exposures one-half, or even double them. On cloudy days the curve of intensity increases slowly until 9 A.M., thence more rapidly until 11, remaining about constant until 1 P.M., with maximum at 12; thence decreasing rapidly until 3 P.M., and afterwards gradually till dusk.

Increase of temperature appears to favor shorter exposures, but this element is not constant. Dust, haze and smoke increase exposures more especially in the morning and evening. Before an electric storm exposures are increased, while immediately after much shorter ones will suffice.

Of conditions somewhat under control may be mentioned :

1. Clearness of skylight.
2. Color of curtains.
3. Speed of plate.
4. Size of diaphragm.
5. Kind of developer.
6. Temperature of developer.
7. Complexion of subject and color and character of draperies.

In view of these conditions we must conclude that our knowledge of what constitutes proper exposure is a modified ignorance. We have no practical guide but experience. Exposure meters and exposure tables may serve as decks, but no more. The personal equation enters into such estimates too largely, while a slight change in the temperature of the developer or dark room may upset careful calculation—calculations, by the way, that are generally made after "taking." Careful development must supplement judicious timing.

The amount of exposure absolutely necessary is dependent on the constitution of the latent image. If the change produced by the impact of the light on the sensitive surface be chemical, then it stands to reason that any exposure is sufficient, provided a developer of sufficient energy be applied. This is a very comforting theory, and if correct we may cease trying to force our plates to a sensitiveness that is already inconveniently great, and turn our attention to the production of a stronger developing agent.

If, on the other hand, the change produced by the light is mechanical, a definite exposure is necessary to overcome the inertia of the sensitive coating. I myself think the change is mechanical. A reason therefore is, that while heat favors chemical action, the period of maximum sensitiveness does not correspond with the period of maximum heat. Again, on hot and damp days, what we call muddy weather, when the developer works with almost uncontrollable energy, making the production of clear shadows a matter of difficulty, exposures must be lengthened, although the day be bright and clear. On this point, however, our knowledge is unmodified ignorance, and I bring to a close this contribution to the vast encyclopedia of what we don't know.

ALBUMEN PAPER.

BY T. C. FELLOWS.

[Read at Washington Convention.]

WHAT can be said of albumen paper, that long-suffering, ill-used servant of the photographer? How often has it been abused in the columns of our periodicals; how often do we hear the cry that it does not fill the requirements of the photographer, and how often have manufacturers endeavored to displace it in public favor by the introduction of collodion and gelatine papers?

Notwithstanding that albumen paper has long outlived its infancy, it is still subject to many diseases incident to childhood, namely, scarlet-rash, measles, spotted fever and eruptions of the skin, etc., and then the many cases of general debility and weakness, that impure, impoverished condition of the blood, producing the distressing malady, blisters, which is the worst of all, and by far the

most difficult of cure. All this may be true, and yet I know nothing more amenable to kind treatment than albumen paper.

It will not be necessary to go into the particulars of its manufacture—they are too well known. In fact nothing that I can say is entirely new. The whole story is something more than a "twice told tale." With the full knowledge of its manufacture, and with the instructions given in the standard text-books, it is difficult to understand why so many complaints appear in the columns of our magazines. One cannot run through a copy of any one of our photo journals without meeting subjects with such titles as "How to Prevent Measles;" "How to Prevent Blisters;" "What I Know about Blisters," etc.

A photographer from Texas, writing to Anthony's Photographic BULLETIN, says that for ten years he has been trying to find a brand of paper that would blister under his treatment. Another retorts in the next number of the same magazine that all Brother — has to do is to come over to this country and he will be seeking for a brand of paper that will not blister. One will advocate plenty of alkali all through the manipulations, and a weak hypo bath with about an ounce of strong ammonia to each gallon of solution, and defies blisters. Another says: not so much ammonia and strong fixing bath. One suggests from thirty to forty minutes' fuming, another twenty to twenty-five minutes. One writes that the water is so hard in his locality that he can't do anything with his prints in toning and fixing unless he first softens the water with more lime or ammonia, and that his prints were covered with a white deposit, which he cleaned off with acid solution after they were fixed and washed.

It is not my purpose to enter into an argument as to the best method one should employ in the production of silver prints on albumen paper. Any of the methods given in our standard text-books are thoroughly reliable, and the mere fact of their being published in these books is a sufficient guarantee of merit. Therefore, this being the case, it simply resolves itself into the manipulation and the working. There are certain rules to be observed, namely, cleanliness and an attentive regard to the condition of the chemicals and weather. This done, the intelligent printer is prepared for any emergency, and watches the barometer very much as a physician would watch the pulse of his patient, and can guard against the varying conditions of the temperature, and thereby prevent the ills so much complained of. A little experience and observation will soon teach him that red measles indicates weak silver, or not an over-strong bath and insufficient fuming; that black measles shows that his paper is insufficiently dry before fuming; that rusty-brown printing means an acid condition of the silver solution, or a bath very much clogged with impurities, albumen, etc. These two faults will also produce red measles. (At a time like this the bath must be renovated by evaporating and sunning.) That prints which come up hard and blue, lacking brilliancy and with a crackling appearance, indicate a very alkaline condition of the bath. Albumen paper will take up the silver solution more readily and evenly if it is previously dampened in a box built for the purpose than it will in a dry condition. When it is slightly limp the tendency to tear in cold weather will be largely overcome, but this will not occur if the sensitizing room is kept at a uniform temperature of 70 degrees. Again, prints bronzing too deeply, even in the light shadows, indicates too much strength of silver, and that this same strong silver will also produce measles of a peculiar kind owing to the lack of silver absorption in the sheet of paper.

Do not forget that strong silver has a coagulating effect on the albumen, and that the paper must be floated sufficiently long to permit the complete saturation of the albumen film. If this is not done the effect will be much the same as when the silver is weak. In toning, the intelligent printer will learn that in those prints which evinced symptoms of measles the disease will develop with frightful rapidity, and that the prints are for ever ruined. He will observe that the rusty brown prints cannot be improved in toning.

He will also have cause to remember that prints which indicate excess of alkali will, ten chances to one, soften in the toning-bath, and the surface is likely to rub completely off; and that a too rapid action of the chloride of gold

will cause a precipitation of the metal in the form of minute red spots. In such a case common salt, added in small quantities, will act as a restrainer. Any one can hinder the toning by too much salt or too much soda, and also thus assist in softening the albumen, causing blisters. All these things will teach the printer that in no case are extremes of strength or weakness, alkalinity or acidity desirable; and that the sure road to success is in the "happy medium" path. Now we must refer again to the diseases of the blood, namely, blisters.

We all know that strong acids and strong alkalies possess a wonderful affinity for soluble matter, and that for which the acid has no liking the alkali is sure to have a deep regard.

There are few things beyond the reach of both. Therefore it follows that if any substance soluble in acids or alkalies is subjected to the action of acid or alkali solutions sufficiently long a complete disintegration of the particles will take place. So it follows that a silver bath made strongly alkali starts up the action of dissolution in the albumen sheet which is supplemented by heavy fuming carrying on the action still further, and by the time it reaches the toning-bath the albumen is quite ready at times to part company with its support. In some cases the whole surface is affected; in others, in spots only. On the other hand, a treatment in which there is too much acid will act in much the same manner. Here, then, to my mind, is the cause of blisters in albumen.

The above statement being accepted as a fact, there will be no difficulty in avoiding blisters. Each worker must be influenced by the conditions under which he labors. If he is located in a district where the water he is obliged to use is about normal, we may say then there need be no difficulty in keeping the middle path. On the other hand, if he lives in a district where the water is thoroughly impregnated and charged with lime and salts of magnesia, then he had best adopt the plan of working his chemicals slightly acid, and in some cases it may be necessary to treat the prints before toning with a bath of acetic acid water, thereby counteracting the evil influence of the alkaline water. The actual cause, then, of blisters is the softening of the albumen film in spots that have been the most susceptible to the softening influence. This action has not been continued sufficiently long to effect a dissolution of the film itself, but has only acted in such a way as to loosen it from its support. Once loose, the water and air work their way through the porous back of the sheet and consequently blister. If the effect has been produced by excess of alkali, one hardly wants to increase the evil by adding ammonia or soda to the hypo solution. I doubt if softening is ever occasioned by extreme acidity. The prevailing idea is that everything should be worked in an alkaline condition; therefore, one would hardly look for excess of acid in a case of blisters. As I said in the first place, it is not my intention to make a long argument, and have dwelt upon the subject of blisters because I think they are the greatest source of trouble.

One other point is the stretching of the paper. This is an important matter, especially in portrait work; for unless the printer is careful to cut his paper all one way of the sheet, a curious assortment of fat and lean portraits will be the result. This is the only way to avoid the difficulty. It can be partially overcome by immersing the prints in glycerine and alcohol; but this, aside from the expense, would require too great an outlay of time for commercial work.

In conclusion, I would say that I have made no mention of any particular brand of paper. I believe that all the standard makes are good, and can be successfully worked by any of the ordinary methods, providing a proper amount of intelligence is incorporated into the manipulations.

I AM in love with the BULLETIN, and take special care of every number. I couldn't think of doing without it.—D. H. ATKINS, Kansas.

THE BULLETIN has proved a grand success, and this is entirely due to its own inherent merits.—CHAS. C. GODFREY, M.D., Conn.

THE CARBON PRINTING PROCESS.

BY T. C. ROCHE.

[Paper and Demonstration before the Society of Amateur Photographers of New York.]

THE fundamental principle of the carbon process lies in the fact that bichromate of potash combined with organic matter, soluble if kept in the dark, becomes insoluble upon exposure to light.

This discovery was first brought to public notice by Mungo Ponton, in 1839. M. Becquerel, Fox Talbot and many others experimented with the newly discovered action of light, but it was reserved for M. Poitevin, in 1855, to bring the process to any practical issue. Poitevin mixed coloring matters with bichromatized gelatine, and laid the foundation of the lithographic and photo-mechanical printing processes now universally adopted.

The first to produce commercially workable carbon tissue and practical formulas was Mr. J. W. Swan, who patented his method in 1864. Since then several simplifying improvements have been made, and now suitable paper in long rolls, coated with pigmented gelatine, is an article of commerce. This paper is cut to the required size and sensitized in a solution of bichromate of potash—water, one ounce, bichromate, 15 to 20 grains. After drying in the dark room it is ready for exposure behind the negative. Negatives for carbon printing should have an opaque border about $\frac{1}{2}$ an inch wide to prevent the action of light upon the margin of the tissue. In this way an edging of soluble tissue is obtained which prevents the tearing or washing off of the film during development. The exposure is by no means the easiest part of the process, as the effect of the light is invisible. A photometer is therefore used and each negative may be marked with numbers corresponding to those on the photometer.

Coat a piece of clean glass or porcelain with plain collodion, and wash it in water. Lay it in a dish of cold water, and place the exposed tissue, coated side downward, in the dish until it lies flat and limp. Raise the glass and with it the paper, lay on a flat table, cover with a thin rubber cloth and pass a squeegee over lightly to drive out the air-bells and to insure perfect contact. Allow to remain for a few minutes and then immerse in water at a temperature of 110 to 120 degrees Fahr. Rock gently. The first portion of the gelatine to dissolve is that which has been protected by the safety edge, and after a short time the paper that supported the film can be peeled off. The glass is now covered with a colored mass, and all that is necessary is to wash with the tepid water until development is complete. The picture is now plunged into cold water and then into a dilute solution of alum. Now wash and dry, and the process is complete. While the surface is wet it is very tender, but it will dry hard and sharp. The collodion is used to prevent the washing away of the delicate details or half tones. Special transfer paper may be obtained for use instead of glass or porcelain. Sensitized tissue will keep for about two weeks if kept in an air-tight box.

Prints treated in the above-described way will show the pictures laterally inverted. To obtain a non-reversed picture, the tissue is developed on waxed collodionized porcelain or zinc plates, and allowed to dry after squeegeeing down the final support. This latter is peeled off and the picture comes with it, readily leaving the temporary support.

Pictures for lantern slides or for porcelain should not be printed deeply, while

those for window transparencies should have full exposure. It will readily be seen that by this process pictures may be obtained on almost any material, wood, celluloid, metals, etc.

One thing is of importance. After sensitizing, the tissue should be allowed to dry in a room well ventilated. Otherwise the coating is apt to become insoluble, and consequently useless.

Carbon pictures are considered to be absolutely permanent, and indeed they are so if proper pigments are chosen for admixture with the gelatine.

At the close of his paper the veteran photographer gave a highly successful demonstration of this beautiful process, the details of which and the discussion which followed will be found in the report of the Society of Amateur Photographers and in the present number of the BULLETIN.

ARISTOTYPE, OR PRINTING ON CHLORIDE OF SILVER EMULSION.

BY LOUIS BRADFISCH.

[Read at Washington Convention.]

THIS process is not new, and yet it is new to many photographers of this country. Photo-paper is coated with an emulsion of chloride of silver in gelatine or collodion, in the presence of a certain proportion of an organic silver salt. Gelatine and collodion papers differ essentially in several points. The latter curls more or less during the operation of washing, thus causing the film to crack and come off the paper. The finished points are also very easily injured by rubbing. Gelatine-chloride paper may be worked the same as albumen paper without any trouble. The principal objection to it is the softening of the gelatine film in warm weather. This, however, is easily overcome and the film rendered insoluble by the application of alum. The paper should be printed and toned same as albumen paper, in a neutral gold bath, but not quick or strong, as for albumen, and then be fixed in an alum-hypo bath. Recently I have tried a formula given by Mr. G. Cramer, of St. Louis. The results were surprising: 1 pound of hypo, 1 pound of alum and $\frac{1}{4}$ pound of bicarbonate of soda are dissolved in 1 gallon of water and left a few days to clear.

In this bath the gelatine film becomes as hard as leather, and appears to be almost indestructible, without showing any tendency to crack when bent sharply. It is also not injured by water after being dry. Such prints are mounted same as silver prints, and dried between blotters. Hot burnishing gives glacé finish. This is also obtained by squeegeeing the wet print on a ferrotype plate or on talced glass, which is very convenient for amateurs. The prints remain perfectly flat after glazing and require no mounting. Gelatine-chloride paper may also be toned and fixed in a combined bath, such as recommended by Dr. Liesegang. This bath should not act too quick. If the prints tone in less time than ten or fifteen minutes they should have a subsequent immersion in a weak hypo bath, otherwise they may be placed in above-mentioned alum-hypo bath for about five minutes—just as coming from the printing frame. If desired, they may be previously washed in two changes of water. After rinsing in water they are placed in the combined bath and toned. This last method is one of the best, according to my own experience, to work artisto paper. There is no fear of stains caused by hypo or uneven toning. The film is hardened on the first immersion and the highlights are perfectly clear, the shadows rich and brilliant; furthermore, two-colored prints are not obtained—the lightest and deepest shadows have exactly equal colors.

The general advantages of aristotype paper are the brilliancy and depth of tone and the preservation of all the fine details and half-tones, which are in general lost by albumen. The paper will also not stretch and cause distortion.

One drawback has prevented me sooner to be able to place a perfect

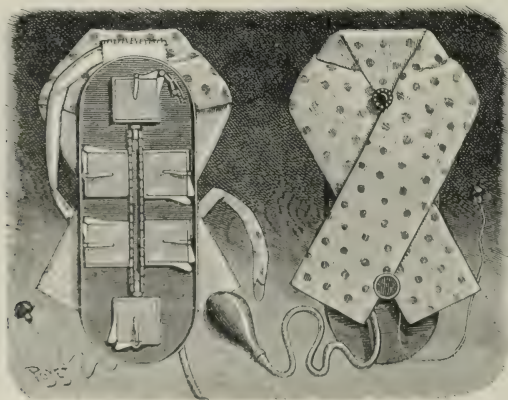
gelatine-chloride paper on the market—not having been able to obtain the proper paper for the process. The requirements for such paper are to be pure and free from the least trace of iron, and to be coated with a very fine substratum, neutral to the above-mentioned silver salts. I am pleased to say that this paper is now in my possession, which enables me to place a fully reliable aristotype paper on the market, which any one may work with ease and to his entire satisfaction.

OUR ILLUSTRATION.

THE photogravure that forms the frontispiece of this issue of the BULLETIN is from a negative taken by Mr. Robert S. Redfield, the energetic Secretary of the Photographic Society of Philadelphia. The view was taken in South-western Virginia several years ago, and represents a primitive blacksmith shop in that region. The scene is singularly picturesque and well worthy of the attention of every lover of rural life. We are glad of the opportunity of reproducing another of Mr. Redfield's handsome pictures, and regret that delay in the preparation of the prints has kept it back so long. The beauty of the original negative is fairly well brought out, and but little of the detail of the original is lacking. As a picture there are few photographs that surpass it.

THE PHOTOGRAPHIC CRAVAT.

BELOW we reproduce a cut taken from the pages of *L'Amateur Photographe*, and which represents a novel form of concealed camera. Behind an ordinary folded scarf is an oblong flat camera carrying six plates 4 x 4 cm. in size. The lens



projects through the scarf and occupies the position where the ordinary jewelled pin is placed. Below is a button that passes through the button-hole of the vest and serves to operate the chain-work that elevates the plates into position as required. A small rubber bulb with tube is carried in the pantaloons' pocket, and works the shutter. This novel arrangement is the invention of M. Bloch, of Paris.

I AM just in receipt of BULLETIN, and I heartily indorse a magazine of its kind. I would say that it gives a professional photographer, as well as the amateur, ideas which he would not become possessor of through any other medium. I take much interest in your illustrations, and I think them superb. Hoping that I shall always be able to obtain the PHOTOGRAPHIC BULLETIN,

C. EUGENE LE MUNYON.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.O.S.
and a corps of practical assistants.

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be continued—whether for one, six, twelve or twenty-
four issues.

E. & H. T. ANTHONY & CO., Publishers.

THE PHOTOGRAPHIC SOCIETY OF PHILA- DELPHIA.

A STATED meeting of the society was held
Wednesday evening, October 1, 1890, the
President, Mr. JOHN G. BULLOCK, in the
chair.

On behalf of the Joint Exhibition Committee,
the Secretary reported that the Council had
recently considered the advisability of continu-
ing the existing arrangement for joint exhi-
bitions. They had concluded, in view of the
difficulty in arranging rules which would be
entirely satisfactory to all of the societies, that
it would be better to make each exhibition
entirely independent, simply arranging that
they should be held annually in rotation in
each of the three cities, as before. By this
means the best work of each year will be con-
centrated in one exhibition, but under the ex-
clusive control of the society holding the same.

The following resolution, which had been
drawn up for presentation to the three so-
cieties, was then read and duly adopted:

Resolved, That the agreement heretofore
existing between the Society of Amateur
Photographers of New York, the Boston
Camera Club and the Photographic Society

of Philadelphia, to hold annual joint exhi-
bitions of photographs, be hereby cancelled,
and in place thereof it is agreed that each
organization will hold a public exhibition of
photographs, open to all photographers of the
world, every third year.

These exhibitions are to be held annually
in rotation in each of the three cities, as be-
fore, but each exhibition will be under the
entire control and management of the society
holding the same, and under such rules as it
may adopt.

Each society further agrees that it will not
hold any public and open competitive exhi-
bition except in its regular turn, as above, with-
out the consent of the other two societies.

Neither organization assumes any respon-
sibility in regard to any exhibition except its
own.

Mr. STIRLING, for the Executive Committee,
reported the receipt of a fine collection of pho-
tographs, the work of Mr. H. P. Robinson,
the celebrated photographer of Tunbridge
Wells, England. The pictures had been
kindly loaned to the society through the
courtesy of the Boston Camera Club, and had
been hung on the walls of the meeting room,
where they would remain on exhibition to
members and their friends throughout the
month of October. During the last week of
the month arrangements would be made for
the room to be kept open each afternoon
from 2 to 6 P.M., during which time admis-
sion would be by tickets, which members
could obtain for distribution among their
friends from the Secretary. It was also stated
that negotiations were pending by which it
was hoped that the society could obtain a
collection representing the work of another
celebrated English photographer for exhibition
later in the season. Mr. Stirling also sug-
gested, and thought it entirely possible, that
"one man" exhibitions representing some of
the members of our own society should be ar-
ranged for.

As Chairman of the Committee on Lantern
Slides, Mr. Stirling reported that a circular
had been sent to members calling attention to
the interchange of 1890-91. The circular con-
tained all that was necessary to be said, ex-
cept, possibly, that the members might be
reminded that hereafter the foreign inter-
change, which has been a part of this system,
will be simply a loan interchange.

The slides that go abroad will only be
loaned, and after going the rounds of the
English societies will be returned.

The Committee on Membership reported

the election of the following active members :
Bartram W. Griffiths and Sidney B. Frost.

The *President* submitted the matter of a communication that had been received from the Syracuse Camera Club, looking towards the holding of a convention of amateur photographers. After a brief discussion, Mr. Coates moved to refer the matter to the Executive Committee, with power to act.

Mr. BURROUGHS, for the committee on Revision of By-Laws, presented a report embodying such changes as the committee recommended. The proposed by-laws were read, and, on motion of Mr. Cheyney, it was directed that printed copies be sent to each member for examination prior to the next stated meeting, at which time the proposed changes would be acted upon.

Mr. CARBUTT, in response to a request, gave a brief account of his recent trip in Europe. He had given most of his attention to sight-seeing. In London he had noticed that the tendency in cameras seemed to be towards the hand cameras rather than the stand cameras. He had seen several cameras to hold plates in magazines in London and several on the Continent.

He had brought two or three home, and would show them at some future meeting. In Scotland, the work he saw by professionals in Glasgow and Edinburgh was remarkably fine. A great deal of attention was being given to the production of pictures in platinum. In Edinburgh the pictures by Lafayette were among the very best in photographic and artistic excellence.

The pictures were no doubt worked up with India ink, but there was a softness, yet force, about them rarely seen in photographic prints. In London he did not see much in the way of improvements in pictures. Platinum was being used there to a considerable extent. The technical quality of the work did not come up to the best class of work in America. The pictures in Paris, Geneva, Vienna and Berlin portrayed a great deal of artistic feeling in the drapery and models.

Many, in producing this, do not give the same care to the technical parts of their pictures as Americans. On the journey from Paris to Munich he had encountered rain all the way. At Luzerne he made an exposure in the rain while his son held an umbrella over him. He went up the Righi and made one or two exposures of the shivering mortals who were there waiting for the sun to rise.

In Vienna he made a few exposures among the markets. The amateur photographers in

Vienna have a very large, flourishing society, and were doing a great deal of investigation work. They meet once a month for regular work, and have a social meeting every Saturday night.

Adjourned. ROBERT S. REDFIELD,
Secretary.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

THE monthly general meeting of this Society was held on the evening of October 14th, at 113 West 38th Street. In the absence of the President and Vice-President, Mr. Dayton fulfilled the duties of chairman.

After the reading and confirming of the minutes of the last meeting, the Chairman announced that the first item under the head of scientific business was a demonstration of the "carbon process," and introduced the veteran photographer, Mr. T. C. Roche. Mr. Roche gave an outline of the historical evolution of this beautiful printing process, and explained lucidly the preparation of the pigmented bichromatized gelatine and its manipulation. Mr. Roche's remarks will be found in another portion of the BULLETIN.

He then invited members to come around, and went through the process of transferring and washing. First coating a piece of glass with collodion and washing it in water, he laid it in a dish of water along with the exposed carbon tissue. Raising the glass from the water, it brings with it the tissue, and this is squeezed down; then it is placed in tepid water, when the paper readily stripped off, leaving a black mass of pigmented gelatine on the plate. Wash now with the tepid water, when the gelatine unacted on washes out, leaving the picture on the glass. This is now washed in cold water, placed in a solution of alum, washed and dried.

Mr. Roche developed two pictures with perfect success.

Mr. BEACH—Is it essential to print in sunlight?

Mr. ROCHE—By no means. Indeed, pictures intended for porcelain should be printed in the shade.

Question—How long may the exposed print be kept before transferring?

Mr. ROCHE—The action produced by the light, once started, goes on even when the print is kept in the dark. If correctly exposed, it should not be kept very long without development. The unexposed sensitive tissue will keep for about two weeks if placed in an air-

tight preserving can. In printing, it is necessary to leave a safety edge. This may be done by blackening the edges of the negative or putting a paper mask around it. If this is neglected, the gelatine does not readily transfer, and tearing may result. To correct lateral inversion, double transfer is necessary.

Question—Where can the necessary materials be obtained?

Mr. ROCHE—At Messrs. E. & H. T. Anthony & Co.'s, 591 Broadway. I will leave several pieces of tissue and the requisite materials so that members may experiment.

The *Chairman*, on behalf of the meeting, thanked Mr. Roche for his able and interesting exposition and for the facilities he had given the members for experimenting with this beautiful process.

A discussion on eikonogen followed, in which Mr. BEACH said that during the summer months he had been able to obtain light-colored crystals of eikonogen, which were a real pleasure to use, and much preferable to the earlier form. These were supposed to be permanent, but of late the crystals had become of a brownish hue, giving a colored solution. The matter had been considered by the manufacturers, and was thought by them to be due to water. They advised that the crystals be kept in the air and not in a bottle. To satisfy himself, he had placed the white crystals on a sheet of glass and slightly moistened them. In a few hours they changed in color, indicating that moisture and air had something to do with it. He had thought it would be well to keep it in paraffined boxes, but had learned that even in stoppered glass bottles the change had taken place. It seemed to be still an unanswered question, and he would like to hear Dr. Elliott's opinion.

Dr. ELLIOTT, in speaking, said his experience did not coincide with that of Mr. Beach. The first sample of eikonogen that he obtained was a small bottle of 2 ounces. On trying this it worked very nicely, and he became fascinated with it. Multitudes of duties preventing further work with it, the bottle had stood in his laboratory for some four months, but at that time it was as good as ever. He had seen the dark-colored eikonogen referred to, and thought the explanation of the manufacturers was unsatisfactory. He did not think that the water of crystallization could produce such an effect, but that the coloration was due to carelessness on the part of the makers. Eikonogen, he explained, crystallizes in forms readily separable from the mother-liquor, and if judiciously washed it ought to be per-

manent. This view of the case was also supported, he said, by the fact that some of the crystals are permanent. In some recent German literature he had seen a method for purifying this colored eikonogen. Make a strong solution of the salt, cool, and precipitate with tartaric acid. Hydrochloric or sulphuric acids answer equally well. This precipitates the eikonogen in the acid form, taking away the soda. The precipitate is flocculent, and is readily separated from the liquor. Dissolve again by the aid of sulphite of soda.

Mr. BEACH—Is there much waste?

Dr. ELLIOTT—Not much. The coloring matter is very superficial.

Question—Does it develop equally as well as the original light-colored eikonogen?

Dr. ELLIOTT—There is practically no difference. He had found it advantageous to use acid sulphite of soda in the developer. This substance is largely used in Europe as an anti-chlor. With crude eikonogen and acid sulphite a much better developer is obtained. Good eikonogen dissolved in water, and acid sulphite solution added gives an almost colorless solution.

Mr. Beach exhibited a shutter, the invention of Mr. Bain.

Mr. Turner, of the Gundlach Optical Company, showed a shutter resembling externally the well-known Bausch & Lomb shutter. This, however, was not a diaphragm shutter, having only two leaves. He also exhibited a lens, the front and back parts of which were both triple achromatic combinations. To obtain a lens of longer focus the front lens is removed and the hood screwed in its place. To get a lens of still longer focus—18 inches—the back combination is removed and the front one inserted in its place.

Mr. Tisdell exhibited a satchel detective, a camera with an extremely ingenious shutter, which is always set ready for use.

Mr. A. D. Fisk exhibited a new magazine camera, which has been described in a recent number of the BULLETIN.

This concluded the scientific business, and the meeting went into executive session.

It was announced that the Society had been increased by nine new members. An exhibition of stereopticon views of the White Mountains was promised for October 24th. With regard to the coming joint photographic exhibition, Mr. Beach announced that it had been decided to hold an exhibition open to all the world every three years, to be held in each city in rotation, each Society promising to hold no other competitive exhibition without the consent of the rest.

The meeting adjourned at 10 o'clock.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

THE regular monthly meeting of the Section was held October 7th, at 113 West 38th street, *President* HENRY J. NEWTON in the chair. Owing to the bad state of the weather the attendance was much less than usual.

The Secretary acknowledged the receipt of various photographic publications, and also of entry forms for the exhibition of the Edinburgh Photographic Society.

In presenting the report of the Executive Committee the Secretary said that a lantern exhibition and two papers had been promised for the evening, but neither of the gentlemen was present, being kept away doubtless by the inclement state of the weather.

With regard to the annual outing, which took place on September 4th, Mr. Mason said that he wished to correct an erroneous idea which seemed to prevail in the minds of some friends of the Section. These yearly excursions were not excuses for glorious times and swelled heads, but were for scientific social enjoyment. After a profitable day the party adjourned to the hotel and had a hearty dinner, not one glass of intoxicating liquor appearing on the table. Mr. Mason had copies of the groups photographed at Glen Island, and members were invited to select one for themselves.

Mr. Newton did not anticipate being called upon to speak. This was the first time for seventeen years that he had missed the annual outing. As there was not a set subject for the meeting he thought it would be a good plan for those present to state any pitfalls in photography that it had been their lot to fall into and for the meeting to discuss the same. It was fair to presume that visitors had a reason for coming, and that that reason was a desire for information. There is no worker in photography but has his stock of unanswered questions. This always will be and always should be, for there is a peculiarity in our constitution which makes questions crop up involuntarily on any subjects that we are interested in. These have to be answered voluntarily. These answers may not be correct, but if satisfactory, so far so good, and they will do until by some other means we become enlightened and arrive at the correct solution. The friction of mind against mind is a mental gymnasium, and we strengthen our minds as we strengthen our bodies, by exercise.

Mr. C. VAN BRUNT—How long will gelatine plates last?

Mr. H. J. NEWTON—There are many different kinds of plates. What character of plate is most likely to last? Gelatine is a compound and its supersensitiveness to light is obtained by heating it with silver compounds to a point where decomposition commences. A plate at its most sensitive point is so near the fog line that damp and heat are likely to act on it. Therefore the most sensitive plates are likely to be the least durable unless kept in a cool dry atmosphere. Taking bromized collodion and adding excess of silver we have this free silver acting, and the action is towards sensitiveness until it reaches the fog line. It is necessary, therefore, after some eight hours to wash out this free silver. Mr. Newton had improved this method by washing off the surface silver and then placing the plate in a dilute solution of pure ammonium chloride. This decomposes the silver nitrate forming the chloride, the presence of which was beneficial. In making a permanent collodion emulsion instead of bathing the plate as described, he had found it much more advantageous to add a solution of various chlorides in alcohol to the emulsion. This he had found worked with great success. Pictures from instantaneous negatives prepared with this collodion two years old were used as illustrations in Anthony's BULLETIN.

Mr. C. V. BRUNT had a stock of old plates of various makers and had tested the same. Carbutt's, to all appearance, were perfectly good; Eastman's fogged all over; Stanley's fogged from the separators inwards; Eagle fogged at edges from separators but excellent in the center; Cramer's entirely fogged, showing a very faint trace of a picture but being of a uniform gray color.

Mr. CUTTER, speaking of the Glen Island trip, said the dinner was far better than usual. He gave in poetry a capital description of the day, from its commencement until the landing in New York. This was delivered in inimitable style, and called forth rounds of applause.

Mr. NEWTON, continuing the discussion on plates, said that if it were a Carbutt *B* plate, he would predict that it would keep indefinitely. In the other cases, he thought the fogging due to hypo in the separators. The fogging of the Cramer plates was, doubtless, due to their being prepared extremely sensitive, and to the effort to balance the silver and the bromide not being quite a success. In most cases, the fogging of plates can be traced to the separators, either directly by chemical action, or indirectly by pressure.

All boxes of plates should be stood on their sides, not laid down flat.

Question—How long would the pressure have to act to produce any effect?

Mr. NEWTON—It depends entirely on the intensity of the pressure and on the sensitiveness of the plate.

Question—I use ready prepared eikonogen developer for instantaneous exposures on Cramer 50, and cannot obtain sufficient density. Where am I in fault?

Mr. Newton preferred the use of hydroquinone, especially the developer given by him in a back number of Anthony's BULLETIN. With regard to eikonogen, he had used 5 grains to the ounce of water, and compounded it with stannate of soda in the following proportions:

Stannate of soda.....	10 grains.
Sulphite of soda.....	30 “
Eikonogen	5 “
Water.....	1 ounce.

This was the only eikonogen developer with which he had had much experience, and it gave really good negatives with instantaneous plates.

Mr. C. VAN BRUNT—Many of the manufacturers give 1 ounce of eikonogen to 30 ounces of water. This is not enough. Cramer now gives 1 to 20, and with this good density could be obtained. He could get better results with either hydroquinone or pyro. After development with eikonogen he had found it impossible to use alum, for the film wrinkles and becomes spotted.

Dr. J. Bartlett had taken a gross of Cramer 60 plates to Europe and developed them with eikonogen developer, prepared after Cramer's formula. Out of the gross, one hundred were absolutely first-class. He had had no trouble with the alum, and thought that the wrinkling and spotting were due to the use of too strong a solution.

Mr. Mason thought it better for every one to begin by preparing their own developer. Consider what you want to do and what the constituents are that will bring about the desired effects.

It was announced that at the next meeting there would be an exhibition of lantern slides and of pictures taken at Glen Island.

A most enjoyable and profitable meeting was brought to a close at 10 P.M.

I SEND you \$3 to pay for the BULLETIN. Please continue sending it, or I will have to quit business.

JOHN F. SINGHI,
Rockland, Me.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

WASHINGTON, August 14, 1890.

MORNING SESSION.

(Continued.)

In conclusion, Mr. Luttbeg suggests that the interests of the fraternity would be best subserved if a little more time were devoted to the discussion of questions such as these, and a little less to the discussion of abstract, far-off benefits which may or may not result from our present organization. When the Association has for its object the defense of its members, the promotion of their interests and the advancement of true art, I shall join you with money and good-will, but at present the Convention seems to be devoted almost entirely to the distribution of a few medals to those who need them least at the expense of those who need them most.

All of which is respectfully submitted.

[Letter from G. H. CROUGHTON.]

At the last moment I am reluctantly compelled to give up the journey to Washington. I have been suffering from rheumatism in my right side and shoulder, and am advised not to brave the heat of Washington. I enclose you the paper I had prepared to read before the Convention, with many regrets that I cannot be there to read it.

With best wishes for your success.

[Letter from E. T. WHITNEY.]

I had hoped until to-day that I should be able to attend the Convention on such an interesting occasion as the unveiling of a monument to Daguerre. Perhaps among all who attend this gathering very few could be found practicing the art as early as 1844, or who have followed it with such untiring assiduity for fifty years.

With best wishes for a successful convention, and a desire to be remembered to all present.

REPORT OF THE COMMITTEE ON THE BANKRUPT BILL.

Your special committee to whom was referred a copy of the Torrey Bankrupt bill as passed by the House of Representatives on July 24, 1890, with instructions to report during the present session what course they recommend with reference to the same, beg to report as follows:

The Constitution of the United States reserves to Congress the power to pass uniform

laws upon the subject of bankruptcy, and forbids the States from impairing the obligation of contracts, and as a result the States cannot enact legislation that is comprehensive of the subject.

The Torrey Bankrupt bill is national in its character and is designed to promote confidence between men in different sections of the country, extend and enlarge business transactions, promote morality, prevent the perpetration of wrongs, punish wrongs which are perpetrated, and enable unfortunate honest men to secure a new lease of business life without practical harm to their creditors.

We anticipate that the enactment and enforcement of this measure will, by regulating commercial intercourse and securing every manufacturer and dealer against losses incident to fraudulent preferences, reduce the price of commodities. In other words, the honest men at present have to pay numerous profits upon all of their purchases, whether of goods for the purpose of business or the necessities of life, because of the fact that the people from whom they purchase suffer great losses at the hands of dishonest men, and as a result have to charge their losses to the honest men who pay their debts. Just in proportion as the sellers of goods are secured against losses the prices of goods will be reduced to the consumers.

Your committee are therefore of the opinion that this Association, in its national character, is interested in the enactment of the law, not only in their business and professional capacities, but also as citizens, and accordingly submit the following:

Resolved, That the Torrey Bankrupt bill is hereby approved and indorsed as a measure which embodies provisions for both voluntary bankruptcy and is calculated to promote alike the interests of debtors and creditors.

Resolved, That Congress is respectfully urged to enact the bill without delay, and the President of the United States to approve.

All of which is respectfully submitted.

Report adopted.

The *President*—Report of the Memorial Committee is in order.

Mr. McMichael read the report (see page 561).

After the reading of the report, the following discussion took place:

Mr. ULLMAN—About what is the deficiency?

Mr. McMICHAEL—About \$5,000. This memorial was made almost at cost price. Mr. Hartley said he could have made a bust of Daguerre alone and made more money than he

will out of this. He gave it in the interest of the photographers. The price should have been \$10,000, but in the interest of the photographic world he contributes this.

W. H. H. CLARK—I rise to correct some misapprehensions given out by Mr. McMichael. He stated that he would leave the Association to judge whether the committee or Association had done their duty.

You know that at Boston it was decided that no one should contribute more than \$1. The Association, at Boston, voted \$500 for this purpose, and I believe in the neighborhood of \$500 was collected individually from the members. The photographers at large throughout the United States do not consist of members of this Association. What the photographers at large have failed to do, is this Association to bear the stigma? Not at all.

Another misapprehension has been inveighed here. The Western journals have been held up by this Photographers' Association. Why? Because they have not borne the brunt of the battle and raised the money. I was listening to the reading of contributions from the journals—Anthony's *BULLETIN*, \$9; *St. Louis Journal*, \$8—not far behind.

When this thing was started the *St. Louis Photographer* put its shoulder to the wheel, and when the receipt books were sent out I personally took that book and canvassed St. Louis and other Western towns in favor of the matter. Shall we blame the Western journals? I wrote several times for reports concerning this thing and could get nothing until it came out through one of the Eastern journals. This is no jealousy on our part. The book I carried around. I have the report of a number of others, and one man high in photography and a good judge, said to me—and this will convey the idea of many others: "If the photographers of this country cannot produce a better design of Daguerre, they cannot have my dollar."

Now, I do not think it right nor just to hold up one section of the country against the other. Failure seems to have occurred on this monument business, though I do not believe the West is behind the East in anything pertaining to photography and the high lights in it. At Boston, when this thing came up, I suggested to the committee and the Association, and why it is not in the report I cannot tell: the time, gentlemen, is all too short for this business. It is not business-like. Who would build a house without knowing anything of the cost? It would be proper to collect this money in addition to the \$500 from

the Society; how simple a matter to collect the sum of \$1 each. Had this been done and not rushed through, the result would have been better, but we have tried to do too much with too little time, and with no funds.

Mr. PICKERELL—It has always been my nature that when a wet blanket was thrown over anything, take it off. I voted for Washington because I wanted to come here. I was here twenty-six years ago, when our country was convulsed in war; to-day we meet in peace—the North and South have been bound together as a band of brothers. We are here as a band of photographers for two purposes: to see the City of Washington; to emulate and to elevate and to show the productions of our own photography, and to unveil a statue of the inventor of this noble and beautiful art of ours. It is no matter what our committee has done. If they have committed an error, the statue is here and must be paid for, and every photographer, every manufacturer, every dealer and every amateur feels a pride in this business, that his name will go on the records that he has dropped in his mite. This is not a thing to be laid off at will. There must be no stigma upon this Association. The committee have acted with judgment—they have done their best—let us stand by them.

We have made gigantic strides since last year in photography, but as our work becomes finer we are getting less for it. Now, gentlemen, photographers of America, try to build a monument for yourselves that will last; do not lower the valuation of your work, but elevate it.

Mr. ULLMAN—I was pleased to listen to the address of the speaker, and I think that every intelligent member of this Convention should take part in this discussion.

This is a serious question. A band of men representing one of the most useful arts and sciences shall not and cannot be neglected. It is ridiculous to get up here and take this statue to pieces. Mr. Hartley is one of the most successful sculptors in the country, and stands at the head of his profession. I know that all the artists look upon him with regard. It is useless to indulge in vain regrets that the committee has failed; what is for us to do is to put our shoulders to the wheel and save the honor of this institution belonging to the United States. It is our duty to see that the art and science of photography shall not fail. A monument erected to the inventor of such an art should have an interest in all men's minds. It is our duty to see manufacturers, etc., and to get the money to pay for this

monument. There is no doubt that the money will be raised, and the honor of photography will stand and this society increase. I would suggest the appointment of four or five committees to see the manufacturers and stock dealers and publishers, that they contribute their share.

Mr. GENTILE—I agree with Mr. Clark, and I think there were some mistakes made. When the monument is finished there will be no trouble in overcoming the objection of people who objected to the design. I move that this Association give \$1,000 more towards this matter.

(Seconded.)

Mr. CRAMER—I move that the motion be laid on the table.

(Carried.)

Dr. ELLIOTT—I stand in the position to-day of one who was one of the most earnest advocates for the erection of this statue. A committee, men whom we honor and respect, were appointed with a certain task to be done—that they should obtain designs for a monument to Daguerre. It was not stipulated whom they should employ, but the design must be ready for the officers of the Association to act upon in January. It was decided, if practicable, that the monument should be unveiled this year at Washington. Last year we had sufficient confidence to vote for them to take up this question and carry it out. These gentlemen (not one of them) got the design, approved of it, and ordered the making of the statue; they used the best of human judgment with regard to the resources they thought they could depend upon. They have made a mistake, which they have acknowledged, as to the liberality of the photographers at large. It is erected by the Photographers' Association of America; it is their monument; they should pay for it. I consider it a great honor, though not a professional photographer, to put in my mite of \$25 towards the monument.

Mr. CRAMER—It has been mentioned in the report that St. Louis has done nothing towards collecting. I have been upon so many collecting committees in our city, and for the reason that my time is so much occupied, I did not wish to be chairman of such a committee. At Boston, when the dollar contribution was received, I would have been able to contribute more. It was thought that at the rate of a dollar a person plenty of money would be raised for the memorial, and I did not wish to deprive any one of contributing, but I am willing to help make up the deficiency. I am

very willing to pay \$500 for this purpose, and am willing, if any one does better, to duplicate. I think we have plenty of manufacturers and dealers who make money out of the profession that can get up a nice sum for this purpose. My opinion is that whenever the Association takes anything into its hands it should not be a failure. The committee appointed by our Association should be helped. When the design was questioned, I trusted that the men who had it in hand had enough sense and taste to do the right thing. Not only American journals, but foreign journals, have questioned it, and we have now to show that they have been very much mistaken, that we have made no failure, and that it is a grand success. I hope the wet blanket will be taken off, and it will become the corner-stone of new life to the Association.

Mr. McMICHAEL—Anthony & Co. will duplicate anything any one else will do.

Mr. RANGER—I will add \$10 towards the monument. Gentlemen, send up your subscriptions; don't have it said that we are too poor to raise \$5,000.

(Ten minutes' recess for contributions.)

Mr. HASTINGS—Of the unmounted groups made in Boston for sale one-third of the gross sale will be given to this memorial fund.

The *President*—I am not a man of means at all. I have given \$10 in addition to my first \$1. I will give \$25.

Mr. CRAMER—I hope Mr. Gentile will now understand my resolution to lay his motion on the table; it was simply to give the present members a chance to do what they can.

I move that the Memorial Committee continue their work for the collection of funds, reaching out in all directions possible, to secure the amount necessary to the completion of this monument.

(Seconded and carried.)

Mr. GENTILE—I do not think any motion has been put yet to invite the President tomorrow.

A *Member*—I move that the President, Mr. Hastings and Mr. McMichael be the committee to invite the President.

(Seconded and carried.)

President Appleton begged to be excused from this work on account of being so occupied, and Dr. Elliott was substituted.

JOHN W. MORRISON—I move the thanks of this Association be tendered this Memorial Committee for the excellent work they have done in the face of all the discouragements they have had.

(Seconded and carried.)

The *President*—We will proceed to the election of officers.

(The election of officers was deferred by motion until the afternoon session.)

AFTERNOON, AUGUST 14, 1890.

SIXTH SESSION.

The President called the Convention to order at 3 o'clock, and then informed the Association that the Corcoran Art Gallery would be open at 10 Saturday morning to them; also, that there would be an excursion to Mount Vernon for them at 2 P.M. on that day.

Mr. HASTINGS—I wish to state that the Eastman Company did not enter their exhibit in Class F, enlargements.

The *President*—We think the Eastman Company is to be commended. Now we will proceed to the election of officers for the ensuing year.

Mr. George H. Hastings has been nominated for President. Are there any other nominations?

Mr. BUCHANAN—I move to suspend the rule and elect Mr. Hastings by acclamation. (Seconded and carried.)

The *President*—Ladies and gentlemen of the Convention, I take great pleasure in introducing to you Mr. George H. Hastings, of Boston, who is your next President.

G. H. HASTINGS—Mr. President and members of the Association: I assure you that this expression is particularly flattering to me, and I cannot do justice to it in words. I trust I fully appreciate the position, and will try most assuredly to do honor to the position. My stay with you has been very brief—only one convention before this one—and if the work which I have tried to do has so heartily met with approval, that is gratifying to me. We will try to make the Convention of 1891 as great a success as has been accomplished, but I do not feel my ability to do the work so successfully as my immediate predecessor and others before him. I thank you for the honor shown me.

The *President*—Mr. S. L. Stein, of Milwaukee, has been nominated for First Vice-President. Are there any other nominations?

Mr. ULLMAN—I move that the rule be suspended and Mr. Stein be elected by acclamation.

(Seconded and carried.)

The President introduced Mr. Stein as the first Vice-President for the ensuing year.

S. L. STEIN—Ladies and gentlemen of the

Association: I thank you for the honor. I will do the best I can toward making the coming Convention a success.

The *President*—Mr. W. Stuber, of Louisville, has been nominated for Second Vice-President. Are there any other nominations?

(Moved and seconded that Mr. Stuber be elected in like manner as the two foregoing officers. Carried.)

The President introduced Mr. Stuber as our Second Vice-President for the coming year.

W. STUBER—Ladies and gentlemen, I thank you for electing me as Second Vice-President of the Association very much.

The *President*—Mr. L. C. Overpeck, of Hamilton, Ohio, has been nominated for Secretary. Are there any other nominations?

Mr. Willard C. Davis, of New York, was nominated for the reason that it seemed desirable to have an Eastern man, next year's meeting being in Buffalo.

The *President*—Nominations being closed we will proceed to ballot for the Secretaryship.

The tellers having counted the votes, a total of 131, of which Mr. Overpeck received 38, Mr. Davis 92, and Mr. Wonder 1,

(The President introduced Mr. Davis as Secretary.)

W. C. DAVIS—Mr. President, ladies and gentlemen of the Association: It is with deep feeling that I acknowledge your consideration to-day, and it shall be my best endeavor to fill the office to your satisfaction. I trust my actions may speak louder than my words.

The *President*—The next office to be filled is that of Treasurer. Mr. George M. Carlisle, of Washington, has been nominated. Are there any other nominations?

(Moved and seconded that the rules be suspended and that Mr. Carlisle be elected by acclamation. Carried.)

The President then introduced Mr. Carlisle as Treasurer.

G. M. CARLISLE—Ladies and gentlemen: I very much regret that I have not a larger audience to thank. However, I am just as thankful for the few here. It has ever been my habit and custom to treat all the people who come before me with consideration. It is difficult to do your duty sometimes without offence, and I have tried not to offend. It is my purpose the coming year to do all I can for the Association. I thank you again, and being very busy, I beg to retire.

The *President*—I have a paper from Mr. A. St. Clair, of Des Moines, Iowa. It has no title. What is your pleasure in regard to it?

Moved and seconded that it be put upon the record so that it can be borne in our journals.

(Carried.)

The President announced the result of the morning's work for the Daguerre Memorial as \$1,945.

The business for this session being closed, it was decided, after some discussion, that the remaining papers for the afternoon be postponed until the evening session.

It was moved and seconded to adjourn until 7.30 this evening.

(Carried.)

—————
EVENING, AUGUST 14, 1890.

SEVENTH SESSION.

The *President*—The Convention will please come to order. Mr. Loomis will now read an article by Professor D. P. Todd. (See next BULLETIN.)

A vote of thanks was then passed for both Professor Loomis and Professor Todd.

The next paper read was on "Orthochromatic Photography," by G. Cramer. (See page 590.)

Mr. ROCHE—Mr. Cramer has given the correct history of the work, and all I can do is to confirm what he has said.

T. C. Roche, of New York, exhibited some specimens of this class of work made on Dr. Vogel's eoside of silver plates obtained from Messrs. E. & H. T. Anthony & Co. He showed the original colored pictures, copies from same by the ordinary dry plate without a colored screen; also on ordinary plates in combination with the screen.

To show the great difference in the results, he had mounted on the same cardboard proofs made from the Vogel eoside plates, with and without the colored screen. He stated that it was a well-recognized fact that to obtain the fullest color value you have to use plates specially prepared for such work, like those of Dr. Vogel, where the gelatine emulsion is mixed with eoside of silver previous to coating the plates.

He preferred to use his colored screen inside the camera, and at back of the lens; he found the eoside plates to work uniform with any good developer.

A Member said he had been experimenting for the last six months, which confirms what has been said.

Mr. Cramer remarks that still more care has to be taken in developing. The plates are very sensitive to light. With orthochro-

matic plates it is noticeable that they are sensitive to red light as well as blue light.

A Member—Is there any money in using it?

Mr. CRAMER—I think there is for experimental purposes. I can state that it has received much more attention in the old country than here. It is also possible to take pictures by gaslight. This can be done by the ordinary plate in case the gaslight is not yellow. In landscapes made with orthochromatic plates there is a great difference. The blue of the sky is not to be distinguished from the white clouds. And the different shades in the green leaves cannot be reproduced. It is also impossible to do justice to red hair, freckles or blue eyes. They are never given their full value.

Mr. Tenant says he has used orthochromatic plates for photography in the old country. It is necessary to have about double the exposure.

Mr. CRAMER—It is not used because of the slowness of the plate. It cannot be done with the rapidity which is desired. If a yellow screen is used, it slows the plate considerably, and the darker the plate is the more the exposure is lengthened. The darker glass will require twenty times the exposure. You cannot make a plate as sensitive as an ordinary plate. There is no more difficulty in using the red light, but you must be very careful with the light. It is not rapidity which is of so much importance—it is the development in this process. The further you continue the development the more you will see the effects. A colored screen has to be used to get the full effects. At the last Convention, at Boston, I had with me a set of papers which fully illustrated the difference between the orthochromatic plates and the ordinary ones in colors. The difference is very apparent, even to the inexperienced eye. I examined a book which was bought here and contained a plate; one copy was made with the ordinary plate and did not show the design, but the auto-plate showed the design very distinctly, and the difference between the two was very apparent. The orthochromatic plate was perfect.

A Member—Do they get a different color than this with a white light?

Mr. CRAMER—With the yellow plate the use of the yellow screen is less necessary. It enables the operator to make copies with gaslight. You can see the dye still in the plate after it has been washed and fixed. Any flaw in the glass will destroy the sharpness of the picture. The greatest difficulty is to get it all

a perfectly even color; for you will find that if the color is more intense on one side than on the other it will be a very difficult thing to get it perfectly even. Have made pictures by gaslight in galleries, and so far as I can see it will produce a very fine light. The exposure is about three times the length of time.

The President then called upon Mr. Taylor to give a comparative test of flash-light compounds.

Dr. TAYLOR—A short time ago I commenced experimenting with this substance. I was engaged in making experiments for the purpose of finding a smokeless powder to do for small arms—a powder that would give no smoke—and in the course of my investigations and experiments I discovered this new compound. I have succeeded in making an absolutely smokeless powder, which will be shortly submitted to the War Department, but in the meantime I have discovered this powder. It gives a good flash, bright light, and I think it quite possible that it may be very useful in photography. I have not been able to collect much material at this time of the year, but it can be easily accumulated in quantities. I have never collected it in any large quantities, and have none of it for sale, for the simple reason that I do not yet know whether it will be useful in photography or not. However, this point I intend to test to-night. I do not put it forward for the reason that I am ignorant of its chemical qualities. You will find it very quick, and it gives a brilliant, white light. Whether it will prove to have a particular value and be useful to photography remains to be proven. One of the principal ingredients in its composition is milkweed silk hairs (showing sample). It has been endeavored for many years to bring the silk into use as a fiber material in India. It has been used a great deal for embroidery, but it has been a complete failure, for the reason that the hairs are very like the hairs of cotton plant, because that they are smooth. It twists of itself. The fiber has a tube coming to a point like a horn. Agricultural papers state that from its rotten character (a very inappropriate name) it will not hold together. When burned it gives very little ash. I have tested cotton for the same purpose, and a vast number of its fibers, and have tested a great number of other substances, and find that this is far superior to any of the others. This is something we want; it will not burn up our carpets nor our fingers, and it will not explode. This light, whatever its chemical properties may be, has the following

valuable properties: You can mix it with sand, and you need have no fear of explosion. Put it on the mantel and beat it and it will not exhibit any fulminating properties. You must put a match to it in order to have it burn or make a light. I will now give an experiment on a piece of tissue paper, and I expect it will not set the paper on fire. (Illustrating.) A piece of punk to light it with is all you require. (Experiment.) The experiment was a success.

The President then called upon Mr. D. L. Hurd, of Providence, R. I., who read a paper on "Retouching." (See page 594.)

A vote of thanks was moved and seconded and carried for Mr. Hurd. It was moved and seconded that a paper be read on "Albumen Paper," by Mr. J. C. Fellows. The vote was carried. (See page 623.)

Mr. Hetherington was then called on by the President, and said: I did not expect to be called upon, and am consequently unprepared, but will make a few remarks. The article of which I speak is very useful in printing, it is what I call printers' paste. It is a paste that you can vignette. You can make it so you can use it in an hour's time. One useful point is that bolting-cloth is very useful in the printing-room—the bolting-cloth used by millers—and some very pretty effects can be made by putting bolting-cloth in front of the lens. You will get a very pretty effect.

(To be continued.)

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—J. R. N. writes: Can you tell me through the columns of the BULLETIN how I can turn a negative to a chloride of silver positive according to Obernetter's process, which is spoken of in one of the English journal year books, but gives no formulas? It is in an article on "Obernetter's New Process of Photogravure," where he converts the negative into a chloride of silver positive, which is put in contact with a flat copper plate, and the deposit on copper plate is treated to galvanic action, which converts the chloride into soluble chlorine and metallic silver, thus hollowing out the plate.

A.—We believe the process you refer to is by the use of copper bichloride (cupric chloride). A bath of this salt would convert a silver negative into silver chloride as you

mention. We remember seeing the process in one of the German papers several years ago, and think it was reproduced in the BULLETIN; but owing to lack of knowledge of the exact date we are unable to find it. If you can tell us about the date of its publication in the English annuals we may be able to help you. It probably occurs in the BULLETIN of the same year, if you have a file of the journal that you can refer to.

Q.—Subscriber writes: Will you please answer through the BULLETIN the following question: If a lens of a certain make, with an angle of 60 degrees, diameter of 2 inches, and an equivalent focus of about 15 inches, working wide open, will, in one-tenth of one second, give a correct exposure; does it follow that another lens of the same make and style, with the same view, the same light, but 4 inches in diameter and about 30 inches equivalent focus, also working wide open, will give the same intensity as the first lens? If not, please state the scientific reasons and oblige.

A.—Since the diameters of the lenses are as 2 to 4 the amount of light transmitted will be as 4 to 16, or the large lens will be four times as fast as the small one. But since the intensity of light varies inversely as the square of the distance, and the foci are as 15 to 30, the amount of light that will reach the plate will be as 900 to 225, or the 30-inch focus lens will have one-fourth of the intensity of the 15-inch one. From this it appears that the two lenses would work with the same intensity.

Q.—J. R. L. N. writes: "Can you give me a formula for a zinc solution to remove all traces of hypo from both negatives and prints? I know such preparations are put up, but I desire the formula.

A.—We have never heard of zinc solutions being used as hypo eliminators, but suppose they might serve this purpose when properly used. Lead nitrate or acetate have been used as hypo eliminators, and a bath of 5 or 10 grains to the ounce of water will answer the purpose.

Q.—G. T. K. writes: Will you kindly tell me through the columns of your journal how I can prevent blisters? I have been using paper silvered with the following bath:

Nitrate silver 50 gr.

" ammonia..... 50 "

Water 1 ounce.

With aqua ammonia sufficient to turn red litmus blue, and toning according to the formula sent out with ready sensitized paper,

fixing in a bath of 1 to 8, I have found that by adding aqua ammonia to the fixing bath in sufficient quantity that it will prevent blisters, but it also destroys the brilliancy of the print, and so weakens the paper that you can hardly handle it.

A.—Use a salt bath between the toning bath and the fixing solution, and also use the latter much weaker, say 1 in 20. Use very little ammonia in the fixing bath, not over 1 fluid dram in a quart of bath, and less, if you can preserve the tone.

Q.—S. H. writes: Would the use of a copper developing tray have an injurious effect upon pyro, hydroquinone, or eikonogen developer?

A.—We do not see any reason why a copper developing tray should not be used with any of the alkaline organic developers, if the trays are thoroughly cleansed after use. Tinned copper would probably be still better.

Views Caught with the Drop Shutter.

N. C. THAYER & CO., the well known photographic merchants of State street, Chicago, were burned out on October 6th. The loss upon the stock, etc., was about \$65,000, the insurance \$40,000. The total loss with others in the building amounted to about \$150,000.

Messrs. ZIMMERMAN & PRINCE, of York, Pa., are about to open a new studio in that city. We wish the enterprise the success which the energy of the two young partners deserves.

F. S. HAWKINS, of Washington, Pa., has sold his studio to E. P. Swart and H. M.

Horn, and it will hereafter be conducted by Mr. Swart.

ZIMMERMAN BROS., of St. Paul, Minn., having bought out M. L. Corman, of Duluth, have established a branch house in the "Zenith City of the Unsalted Seas," where they will carry a full supply of photographic materials. Photographers who are nearer Duluth than St. Paul will be glad to know of the enterprise of the Brothers Zimmerman, and that everything from the factories of our publishers can be obtained at the new establishment.

ALBERT WUNDERLICH, late of the firm of O. H. Peck & Co., has started in Minneapolis with a full stock of apparatus and materials from our publishers, as well as from other manufacturers, and expects to see all his friends as they journey in that direction.

PACH BROS., of New York, have been compelled to move from their new studio at 841 Broadway to 935 on the same street. The floor below them at 841 has been leased to a manufacturer, and the vibrations of the machinery made it practically impossible to work in their studio, hence the change.

As we go to press we regret to hear of the death of Mrs. Maria Adams Follet, the sister of Mr. W. Irving Adams, of the Scovill and Adams Co. She passed away on the evening of September 29th. We tender our sincere sympathy to Mr. Adams and all bereaved friends.

Mr. W. J. ALTHANS, late with the Cramer Dry Plate Co., gave us a call recently on his way to Europe.

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SCENES ABOUT NEW YORK.

NEGATIVES MADE WITH THE

SCHMIDT DETECTIVE CAMERA AND

DALLMEYER LENS.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*
ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

NOVEMBER 8, 1890.

Vol. XXI.—No. 21.

THE PHOTOGRAPHIC EXHIBIT OF THE AMERICAN INSTITUTE FAIR.

As usual the managers of the American Institute devote a liberal amount of space to the display of photographs; and also, as usual, we note that although there are a few additions to the exhibitors of former years, there is not nearly as good a representation of the photographers of New York and its vicinity as we think there should be, or as the excellent facilities of the fair so well afford. As we have said on a previous occasion, it appears to us that the members of the Photographic Section of the Institute are not made to do their proper part in these annual fairs. If the members of the Section would but put a little energy into this matter, and interest photographers during the summer so that the exhibits may be on hand for the Fall exhibition, we are satisfied that where only a few of the more enterprising members of the fraternity are now represented, we should see the achievements of hundreds whose work would be exceedingly interesting to all visitors to the fair, and would add very materially to the reputation of men now known to the fraternity only. If the authorities of the Fair will supply us with the necessary rules and regulations at an early date in the summer we will gladly call attention to the coming exhibition in the Fall. But a little personal endeavor on the part of those who should be interested in these exhibits would add very much to the success of the photographic display as represented at the Institute Fair.

We will now give a review of the various exhibits to be seen at the present time at the Hall of the Institute at Third avenue and 63d street, New York.

In the vestibule, and on the right, just before entering the main building, is a handsome exhibit of crayons and pastel portraits by Ullman. These are stamped with artistic taste in every particular—excellent modeling, in both the crayons and pastels, and a delicacy and refinement of coloring in the latter that is very pleasing to the observer.

Upon the opposite side of the vestibule we noted an exhibit by Perkinson. This is a cheap variety of photographic work, consisting principally of cabinets and groups; but, considering the price asked for the pictures, they are remarkably good, and we wonder how any one can make even a living with such an expenditure of labor as we saw put upon the cabinets. Possibly quality may compensate for the small margin of profit obtained in any single case.

Turning now into the main hall and coming to the alcoves, reserved especially for photography, we note an exhibit of free-hand portraits (so called), some of which are colored. We cannot say that we admired them very much,

and believe that bromide enlargements, carefully worked up, either by hand or with the air-brush, would produce decidedly better results. The coloring was not over harmonious, and at times somewhat hard.

Dana has a magnificent exhibit this year, and deserves the highest praise for the beauty of the work and the artistic arrangement of the whole display. The pictures range from 18 x 22 down to his pretty ivoryettes of cabinet size. A marked feature of the collection is the careful use of the background, which is always subsidiary to the true object of the artist, a good portrait.

We also noted the soft and effective modeling of the face in all the portraits, giving results that are marvelously beautiful in light and shade and an artistic tone to the pictures that is rare in modern portraiture. These results are not obtained at a sacrifice of everything else, for the fabrics of the dresses are also finely brought out. The whole exhibit shows the highest photographic skill, and is worthy of prolonged study. The character of the pictures varies greatly, from the pretty little cabinet heads and groups of two and three, to the bold and handsome life-size portrait, full of vigor and the characteristics of the individual portrayed. There are also some charming genre studies, full of artistic beauty and picturesque in every sense of the word.

Wilhelm has an excellent exhibit, showing steady progress on the part of this artist. Some pictures of trotting horses, also carriage groups, are very well done. Ladies on horseback are also a very fine feature of this exhibit. The large portraits and crayons are quite effective, although we cannot help thinking that they are sometimes a little hard from defective lighting; nevertheless, they are good work. The cabinets of this collection are good, with good modeling, and we are surprised that the same good results are not obtained in the large crayon portraits. More attention to this detail in general would make this work uncommonly good.

Fredericks as usual has a fine exhibit. The cabinets show no lack of the usual care and good taste of this well-known Broadway artist. The large work of the exhibit is of the usual fine order. Some magnificent life-size heads of President Garfield, Ex-Secretary Manning, Postmaster Van Cott and General Grant form an interesting feature of the display. A large frame of medallion portraits of the proprietors and managers of New York hotels is also very fine—an unique collection of some of the handsomest men in this great city. We must not forget also an excellent collection of child portraits, life-size and full of childish character.

Tanquerey is a new exhibitor at the fair, at least we have not seen any of his work lately. It is of the first order in photography, and we hope he will continue to exhibit his yearly progress at the Exhibition. The crayon work is very effective and finely finished. The cabinet pictures are of the best work in this class. There is also some very good pastel work by the same exhibitor.

De Young exhibits crayons, pastel and oil portraits, the best of which are the first. In the case of pastels and oil work we think there is a lack of softness about the eyes that to our minds appears objectionable; they have too bold a look, and are decidedly hard. The cabinet work is good and well finished.

G. G. Rockwood has his usual fine display. A notable feature is the excellent enlargements of interiors. These are very finely done and well worthy of study in the matter of detail and the uncommonly good rendering of the lights and shadows in the remote parts of the pictures. Enlargements of landscapes

are also very good indeed. The pastel and oil work of Mr. Rockwood is of that high standard which for years has been characteristic of his studio. One charming piece of oil-painting is the study, "Fine Feathers Make Fine Birds," the little girl, with a dilapidated sunshade and an imposing train, that formed a frontispiece for the *BULLETIN* some time since. The rendering in color is charming, and gives a life and character to it that at once captivates the eye of the observer. It is one of Mr. Rockwood's best efforts in this line. We must not omit to mention also a fine collection of his tessarograph and triplex portraits of children. These pictures are his own creation, and are always beautiful, the little subjects beaming with fun and frolic that he so well knows how to draw out.

Parkinson, whose work in large portraits is too well known to need commendation, has a fine display of portraits and genre studies. That telling picture, "I'll Take Care of You, Grandma," that has become so popular in the print stores, is from his studio, and is on the wall of the Institute. Also others: "I Love 'em Both," a charming little girl hugging two fine dogs; and "Lean on Me, Grandma," a little child and an old lady—an exhibition of the same childish confidence that gives such a touch of nature to works of this kind. The portraits of this exhibitor are not excelled by any other artist, and the cabinet pictures are of the first order.

As a neighbor to the above fine exhibit, and as if by contrast, we noted a display of decidedly cheap work, crayons and cabinets. When we state that a card informed us that we could obtain twelve imperials for 99 cents, further comment is unnecessary.

There is yet another exhibit that we must not forget, and that is the flash-light work of J. Hall, who takes portraits and groups of the visitors to the Institute for a moderate sum, and whose work done under such adverse circumstances is very good. On examining the pictures we were surprised at their quality and the skill with which the light is managed.

Altogether the exhibit at the fair is well worth seeing; but we think it might be much better if it were managed a little differently, and some more members of the fraternity could be induced to show their work.

EDITORIAL NOTES.

In the photographing of clouds it is well to keep in mind certain points which, if acted on, will save many failures. In the first place, if the sun or any brightly illumined portion of the sky, is to appear in the negative, either films or plates coated on ground glass should be used, to avoid halation; and whatever lens is used should be stopped down to a very small diaphragm, and in all cases, except where red sunrises or sunsets are being photographed, the exposure should be very short, say, on a slow plate, not more than one second, which in cases of red light as above, may be increased to even eight or ten seconds. In the development of the negatives great care must be exercised not to carry the development too far.

SOME interesting experiments have recently been conducted by Mr. Hermann Fol, at Nice, with a view to studying the nature of light at different depths below the surface of the sea. His investigations have shown that objects which, at a depth of 30 feet show a bluish tint, change their color at a depth of 80 feet,

and take on a color that is almost black. The blue rays are found to penetrate to the greatest depth, and the red rays are the first to be lost sight of, which accounts for the fact that the diver, after having been long at the bottom, on ascending finds everything in his course taking on a reddish tone, from the fact that his eyes have been tired to the sensation of blue rays by long continued presence among them.

THE forthcoming exhibition of process work at the New York Camera Club promises to be even more interesting than was at first thought possible. All the leading houses in the city, and many outside, have promised exhibits, and everybody interested is full of enthusiasm. The exhibition lasts from November 3d, two weeks, and cards of invitation may be obtained from the Secretary, H. T. Duffield, at the rooms of the Club, 314 Fifth avenue.

THE heavy storms of the past two weeks have proven of great interest to many amateurs, who have made frequent trips to the shore all about New York, and with the result of securing many beautiful studies of surf and waves. One often misses some of the finest effects in nature until they are brought to his notice through his camera.

WE are in receipt of invitations from the Boston Camera Club, to attend their Fifth Public Entertainment at the Union Hall, one of the cosiest and best arranged halls in the city, on the evening of November 10th, on which occasion the slides to be shown will be of Chicago, and are expected to be of great interest to all, as demonstrating the growth and present appearance of the Fair City of the West. If we are not present it will be not from lack of interest, but because time and distance render it impossible.

A DELIGHTFUL opportunity was presented on the afternoons of October 16th, 17th and 18th, to a favored few to examine a fine collection of views made along the line of the New York and Hudson River Railroad, and embracing many of the principal points of interest from the station in New York to Lake George and beyond. The photographs ranged in size from 10 x 21 to 17 x 76, and were all from negatives of W. H. Jackson & Co., of Denver, Col., and were executed in their usual fine style. Those who did not see them missed a great treat.

THE passage by Congress of the McKinley bill and the Silver bill is destined to make a very material advance in the cost of all kinds of photographic requisites, as those familiar with their provisions cannot but know. With the advance on albumen paper of 20 per cent., and the increased rate of silver, two very important factors in photographic work are at once seriously affected, while the additional duty on glass strikes heavily on the manufacturers of dry plates in this country, and the result will be that all using photographic materials or chemicals will probably soon see a considerable advance in most goods of this nature.

WE are in receipt, from Francisco T. Valiente, of San José, Costa Rica, of two very interesting photographs showing a woman and her small child saved from death during the terrible earthquake of December 30, 1888. The grouping and posing are good, and the handling of the accessories very realistic. These views, being authentic, are much sought after by those familiar with the events.

A USEFUL and novel application of the electric light and photography comes from England, where an enterprising manufacturer of wall paper, having been struck by the beauty and uniqueness of the shadows of leaves and tree forms thrown by the electric light, conceived the idea of photographing and applying them to his papers. Many of the designs which have been worked out on this suggestion are said to be extremely beautiful.

WE are glad to note that the Hoboken Camera Club has reached a point in its history where it needs better accommodations than are afforded by its present quarters, and still more glad to know that, knowing its needs, it is able to go ahead and supply the deficiency. Plans have recently been accepted, and work will shortly be commenced on a new building which is expected to be finished in the spring, and which, when completed, is to cost about \$12,000, and is expected to be one of the most perfect club-houses for photographic work in the country.

AN indication of the value of photography to the scientific world is to be seen in the constant experimenting which is being carried on by prominent scientists both in this country and abroad. Professor Ahn, of Breslau, has, by its means, recently succeeded in fixing the indications or symptoms of different diseases of the eye which must prove of great value to the medical profession; while at the same time a very prominent anthropologist of the world has lately, in Paris, been engaged in making a collection of the various types of mankind. The result of his researches induces him to believe that the type or race-mark is much more easily to be recognized and better preserved among women than among men, and he has, therefore, secured photographic likenesses of many of the most beautiful women to be found in the course of his travels, which fact has brought out a suggestion from a leading photographer, that all interest themselves in this direction to the extent of making similar collections, with a view of handing down to future ages something that may represent the standard types of beauty of the nineteenth century. For this purpose we would suggest the use of the platinum or carbon process for the prints.

WE are always pleased to note the increase of interest in our favorite art, photography, as indicated by the attention which the various summer and winter resort hotels are paying toward fitting up dark rooms for the use of their guests, the last addition to the list, which has come to our notice, being the Hotel Rafael, San Rafael, Cal. More are certainly coming into line each year than the preceding, and it will shortly be as rare a case to find a hotel without a dark room as it was five years ago to find one with it. We are indebted to our good friend, Sam. C. Partridge, of San Francisco, for the above information.

AN International Photographic Exhibition is to be opened in Liverpool, England, March 6, 1891, which will be continued till April 4th, under the auspices of the Liverpool Amateur Photographic Association. Exhibits should be received in Liverpool not later than January 20, 1890, and any information relative to classes, prizes, etc., may be obtained from Mr. Thos. S. Mayne, Hon. Secretary, Fenwick Court, Liverpool, England.

WE would acknowledge the receipt, from Mr. J. P. Andrews, of a handsome print of the officers of the California Camera Club, which, while it is a greatly reduced copy of the original frame, shows that our brother photographers of the western coast are not one whit behind us in their ability to get up a unique and handsome frame of portraits. We congratulate the club on being able to hang such a specimen on their walls. The work is from the studio of Theo. C. Marceau, of San Francisco.

A METHOD of intensification which has been tried with excellent results, is as follows. The negative, which has presumably been well washed and dried, is soaked in a solution of mercuric chloride 120 grains, ammonium chloride 60 grains, and water 12 ounces. When the film has turned thoroughly white, which should be in about five minutes, remove the plate and wash thoroughly for say ten minutes. It is then immersed in the following solution; 120 grains silver nitrate dissolved in 10 ounces of distilled water, into which has been added, a drop at a time, a strong solution of potassium cyanide, until the white precipitate is nearly dissolved. The solution will then have the appearance of being opalescent, and will resemble water to which has been added a drop or two of milk. Soak in this solution the negative till it has turned entirely black, and then wash thoroughly and dry. This treatment is said to accomplish very fine results, and is we think worth a trial.

OUR attention is called to the fact that on page 574 of the BULLETIN, No. 18, in a report of the remarks of Mr. E. C. Townsend, at the annual dinner of the Photographic Section of the American Institute, the last eight lines of his poem are inclosed in quotation marks, giving the wrong impression that the sentiment was not original with Mr. Townsend. We desire to acknowledge the error, and must lay it where all such errors are laid, at the door of the Printers' Devil, and hope that we may have occasion to print many more lines in the future from Mr. Townsend's pen.

PROFESSOR PICKERING, of Harvard Observatory, has come to the conclusion, from a study of his photographs of the planet Mars, that the southern region has just passed through a glacial avalanche of polar ice similar to that which is the terror of navigators of the North Atlantic Ocean on the Earth.

ENGLISH NOTES.

THE opening of the Annual Exhibition of the Photographic Society of Great Britain in the select London avenue yecept "Pall Mall," marks the climax of our photographic year. The holiday makers have all returned; negatives have been selected, printed and framed (there is much in a good mount and frame); and we now see the best work of the year on the walls of the admirable picture-gallery in Pall Mall. And it is all—or practically all—new work; for the rules exclude any picture which has previously been exhibited in London.

The exhibition contains 750 frames by 171 exhibitors. The judges were Abney, Blanchard, England, Gale, H. P. Robinson and Moore (A.R.A.)—five

photographers and one painter. Twelve medals were awarded ; which the amateurs and professionals have shared equally, six to each. The successful amateurs are Messrs. George Davison, Lyonel Clark, J. B. B. Wellington, J. E. Austin, B. G. Wilkinson, Jr., and H. Tolley ; and the "profs"—R. W. Robinson, Lyddell Sawyer, Shapoor N. Bhedwar, R. H. Lord, W. J. Byrne and H. Vanderweyde. Readers of Anthony's "Annual" will remember the charming studies of child-life furnished by Mr. Byrne to this year's volume. Messrs. Davison and Clark are leading exponents of the "naturalistic" school ; and their fine work gives more the effect of sepia drawings than that of photographs.

In the exhibition as a whole there are fewer large pictures than in former years ; while whole-plate and even half-plate pictures are more numerous. Mr. Bhedwar is a Parsee who came to England two years ago, specially to study photography, and his "Feast of Roses"—girls and garlands of flowers—is beautifully composed. Vanderweyde's "Invitation to Supper" is an ambitious and successful work. It represents a procession of guests (in the costume of George III.) passing along a corridor, and the effect of movement is well secured.

Hitherto the holding of the Annual Exhibition in Pall Mall appears to have exhausted the energies of the "Photographic Society of Great Britain." But a new departure has at last been made, and a "flat," consisting of four rooms, total area 1,080 square feet, at No. 50 Great Russell street, facing the British Museum, has been engaged as a permanent home for the society.

The "One-Man" exhibition of the works of Mr. Lyddell Sawyer, of Newcastle-on-Tyne, which has just been opened in the rooms of the Camera club, will probably be the last to be held on the old premises. The new club-house, in Charing Cross Road, consists of six floors besides the basement, is 75 feet high and contains over 10,000 square feet of floor space. It is anticipated that the number of members of the club will reach one thousand during the coming year.

Mr. Sawyer is a young professional, dwelling in the North of England. He proclaims himself a disciple of H. P. Robinson, and repudiates the desire of the naturalistic school to claim him for their own. His best pictures are figure subjects, whose titles, "Home, Sweet Home," "The Boat Builder," "Love's Young Dream," "Two's a Company," etc., will sufficiently indicate that genre studies are his specialty. His street scenes in Newcastle are also extremely fine. He does not believe in running over half the globe in search of pictures ; but, rather, in using the materials which lie within a few yards of one's own dwelling.

At the meeting of the British Association at Leeds, in September, the Committee on Geological Photographs reported that they had collected 196 examples illustrating geological phenomena ; and they submitted a printed list of the names of these photographs, together with the address, in each case, of the owner of the negative. The committee was reappointed for another year, with a grant of £10 to defray expenses. A committee was also appointed to consider the best means of securing photographs of meteorological phenomena—clouds, lightning-flashes, etc.

Perhaps the most important (photographic) event of the British Association meeting was the description of a new printing process (since called the "diazotype") by its inventor, Mr. A. G. Green. In 1887 Mr. Green discovered a new coal-tar dye called primuline, which he found to be very sensitive to light. A

piece of white calico, for example, is soaked in a weak solution of primuline containing a little common salt. It is then washed and "diazotized" by being dipped into an acid bath containing about $\frac{1}{4}$ per cent. of sodium nitrite. After again washing it is ready for use. It may be exposed beneath a negative, etc., in the usual way, being about as sensitive to light as ordinary silver chloride. It must then be developed by soaking in a weak solution ($\frac{1}{4}$ to $\frac{1}{2}$ per cent.) of certain phenols or amines, according to the tint desired, thus: betanaphthol (alkaline) gives a red print; an alkaline solution of resorcin, an orange print, and so on. By applying the colors with a brush, three or four tints may be obtained on the same prints. One drawback is that the "ground" remains invariably of a yellow tint; but the general effect is often very good, reminding one of the colors on Indian silks. We shall hear more of "diazotype," for the specimens which have, since the meeting of the British Association, been sent to the Pall Mall Exhibition, have attracted general attention and no small share of admiration.

The October number of the *Photographic Reporter* contains a capital reproduction of a remarkably clever instantaneous photograph, by Mr. Louis Meldon, of Dublin, of a bicycle race. The four competitors are rounding a curve, and although the first man is quite fifty yards in front of the last rider, yet all are in equally good focus, a result due to the judicious employment of the horizontal swing-back. The horizontal swing is not often wanted, but—like the Derringer—"when you *do* want it, you want it *bad!*" But it is also specially useful in taking street scenes. The spokes of the bicycle wheels in the picture referred to are quite sharp, although the competitors were traveling at the rate of 25 miles per hour. But the spokes of the upper part of each wheel are just a trifle less sharp than those of the lower half. This confirms the well-known mechanical paradox, that the *top* of a wheel travels faster than the *bottom*. In several instantaneous photos of my own of cab-wheels, etc., the upper spokes are quite blurred and indistinct, while those nearest the ground are quite sharp. Although this fact was calculated out, mathematically, long ago, yet it was reserved for photography to give a direct and positive proof of it.

Lensmakers, beware! The use of "pinholes" instead of a lens is becoming quite popular. In the *Photographic Quarterly* for October there is an article by Mr. Alfred Maskell, on "Artistic Focus and the Suppression of the Lens," which is illustrated by a charming reproduction of one of the author's pictures, taken with a pinhole. It represents some mighty blocks of Cornish granite, with the town of Penzance in the background. It was taken on a bright afternoon in April, with an exposure of eight minutes; the distance of the camera from the rocks was 25 feet; the diameter of the pinhole the $\frac{1}{60}$ of an inch; and the distance from the pinhole to the plate, 8 inches. The "diffusion of focus" obtained by such means is often very charming.

While the price of metallic platinum continues to increase, so that it is now more valuable than gold, that of silver has decreased five pence per ounce during the last month. This is good news both for plate-makers and plate-users.

American photographers will probably remember the death of Mr. C. H. Codman, of Boston, a few years ago, as the result of breathing the fumes of a broken carboy of nitric acid. At Newcastle-on-Tyne, on September 23d, a similar accident occurred in the shop of Messrs. Mawson & Swan, one of the leading photographic material firms in this country. The acid set fire to the

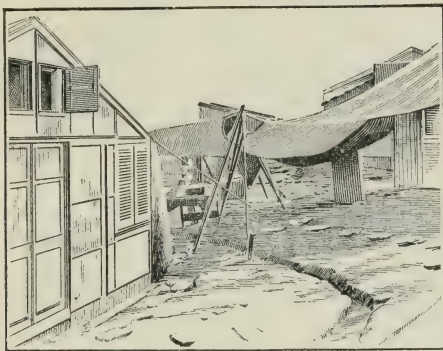
premises, and although the flames were quickly extinguished by the local fire brigade, two of the firemen died from the effects of the fumes and six others were seriously affected. Should a similar accident ever occur in my laboratory, the proverb that "absence of body is better than presence of mind" will be remembered by

TALBOT ARCHER.

THE UNITED STATES ECLIPSE EXPEDITION TO WEST AFRICA, 1889-90.

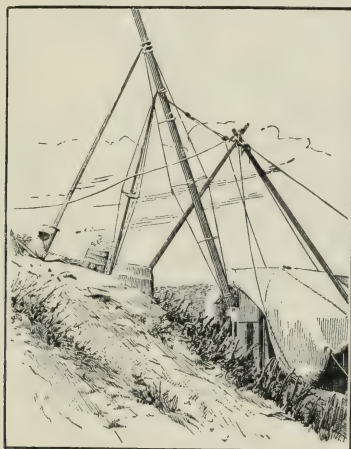
By HAROLD JACOBY, *Columbia College, N. Y.*

ON the 16th October, 1889, the old frigate *Pensacola* steamed away from the Navy Yard, Brooklyn, and put out to sea. She had on board a party of scientists who were sent to observe the total solar eclipse of December 22, 1889.



I. The Camp at Cape Ledo.

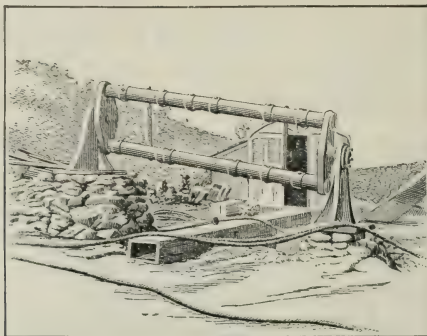
In order to secure a view of the total phase from a point where it would last the longest, it was necessary to establish the observing station at Cape Ledo, on the western coast of Africa, in latitude 9 degrees 40 minutes south of the Equator.



II. The 40-Foot Photoheliograph.

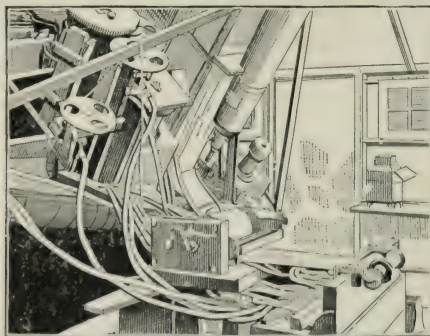
It was decided that the various phenomena of the eclipse should be observed photographically only. The equipment of the expedition consisted, therefore, chiefly of a series of telescopes, spectroscopes and polariscopes, provided with plate-holding and exposing apparatus. Inasmuch as the duration of totality is

always very short (in the present instance just three minutes), it is of course important that all the apparatus be as nearly automatic as possible, in order that but little may be left for the observer to do in the very few moments at his disposal. The plan devised for the eclipse of 1889 provided for complete automatic action of all the apparatus, and little or nothing was left for the observer but to start the machinery at the proper instant. The first essential to securing this end is that all the instruments be mounted "equatorially;" that is, mounted upon an axis pointed at the pole of the heavens, and provided with



III. The Large Polar Axis upon which most of the Instruments were Mounted.

driving clockwork, so that the instrument once turned upon the sun, and the clock being started, no further attention is necessary to secure the centering of the image on the plate during the whole of totality. All this was brought about at Cape Ledo by mounting a very large number of instruments on one immense double axis driven by a powerful clock. This being satisfactorily arranged, it only remained to provide automatic action for the changing of plates and the

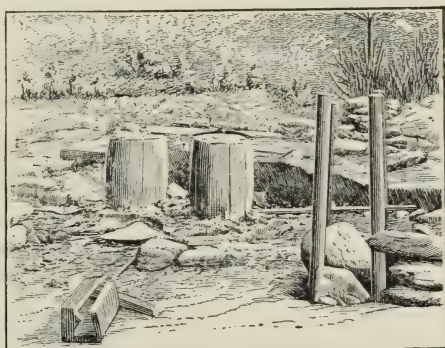


IV. The Polar Axis, Loaded, showing Chronograph and Pneumatic Connections.

opening and closing of the exposing shutters. For this purpose a peculiar pneumatic valve was employed. It was precisely the same as the valves used in some of the automatic organs, which produce different tunes according as one or another strip of perforated paper is driven through the instrument. In fact, precisely such a musical instrument with a strip of perforated paper was actually employed at Cape Ledo, the only difference being that to each perforation belonged, not a musical note, but the operating of a shutter or the changing of a plate. For the purposes of the eclipse, where accurate timing of the exposures

is an essential, the perforated strip of paper could not be moved by simply turning a crank, as in the usual musical instrument. It was necessary to have the paper drawn along quite uniformly by means of a "barrel chronograph," such as is commonly used by astronomers to record the time of observations. Of course, each pneumatic valve on each instrument had to be separately connected with the central "organ" by means of a rubber tube. In this way a very large collection of instruments was mounted at the station. But in addition to all this the expedition was provided with another important independent instrument. This was a 40-foot photoheliograph, also mounted equatorially and provided with a clock capable of giving the necessary movement to the instrument. This instrument afterwards looked very imposing when set up at Cape Ledo, where it must have produced quite an impression on the savages who frequently visited the camp. The *Pensacola* also took out a set of instruments for accurately determining the latitude and longitude of the observing station.

The voyage from New York to Cape Ledo occupied about seven weeks. During that time many instruments were prepared for use on board the vessel. Stoppages were made for coaling purposes at several islands and West Coast ports.



V. The Piers for the Transit Instrument.

Upon arrival at Cape Ledo no time was lost. Sites for the various instruments were selected at once, and the erection of stone piers begun. The transit instrument was mounted on a couple of barrels of solid cement, and was the first instrument set up, since it was important to get accurate local time with the least possible delay. Many difficulties were met with. The landing of the heavy instruments through the surf was often very troublesome, if not dangerous. But all matters of that sort were in the hands of the officers and crew of the *Pensacola*, who, it is needless to say, were invariably successful in getting things to rights. At no time was there any fighting with natives, or with wild beasts of any kind.

Finally Eclipse day (Dec. 22) arrived, and all hands were busy before daylight putting plates into holders, and making final adjustments of the various instruments. Unfortunately the total phase was altogether invisible, on account of dense clouds. Many photographs of the partial phases were, however, taken with the 40-foot photoheliograph. The *Pensacola* went out to sea on the morning of Eclipse day, in order that they might have a chance to get at least a naked eye view of the corona, in case the observers on shore should be disappointed.

No important results were, however, obtained by the people on board; and

when the ship anchored again in the late afternoon off Cape Ledo, it was with sadness that total failure was signalled from the shore.

An English expedition also occupied a station at Cape Ledo, distant about half a mile from the American position. They also obtained nothing ; broke camp the same night, and went to sea in H. M. S. *Bramble*, followed by hearty cheers from our sailors, which were as heartily answered.

ON CERTAIN FAILURES OF THE CARBON PROCESS.

BY P. C. DUCHOCHOIS.

Mr. W. E. DEBENHAM, in a communication to the London and Provincial Photographic Association, entitled "The Present State of the Carbon Process," says that in England—and I will add, in this country also—this process, whose applications are so numerous and so useful, becomes more and more neglected by professional photographers. This Mr. Debenham attributes to three failures, often occurring in the hands of many of those who have worked it : First, a liability to wash off the delicate half tints ; secondly, a want of purity in the high lights ; and, thirdly, a want of vigor in the blacks. To these defects another may be added, white and black images. These defects are not, however, inherent in the process, as can be seen by the admirable proofs made by Mr. Loeffler, of Staten Island, but are due to bad manipulations, unless they result from the imperfections of the negatives, which is the more likely in cases 2 and 3. If the negatives are not sufficiently intense, or wanting in contrast, of course it is impossible to obtain brilliant positives; the whites will be tinted, the blacks not black enough, etc., as by any other printing process ; moreover, the negatives should always be adapted to the printing method selected. But it should be observed that these defects can be more easily attenuated in printing by the process in question, for if one backs the negative with transparent paper in order by working upon the other with stumps and graphite, to make additions, to strengthen the lights—which results in imparting vigor—or to blend the shadows to the lights, the prints will appear "woolly" on silver or platinum prints, but not so if the carbon process is employed.

Now as to the defects. Want of details by washing off the half tints, and hard white and black prints result. The first is from an imperfect knowledge of the properties of gelatine acted on by light in presence of an acid salt of chromium. To avoid it, one should bear in mind that the degree of solubility of gelatine so acted on, as also its degree of impermeability—which is important in photogravure—is proportionate to the degree of insolation; thus: when not impressed bichromated gelatine dissolves in water heated to about 25 to 30 degrees C. (77 to 80 degrees Fahr.), and when acted on between 30 and 100 degrees C. (86 to 212 degrees Fahr.), according to the degree of insolation, the latter temperature being that of solubility of the parts the most acted on. As a rule, the delicate half tints do not, generally, stand a temperature higher than 30 to 35 degrees C. (86 to 95 degrees Fahr.), and therefore as the degree of insolubility of the various parts cannot be ascertained *a priori*, it is advisable during the development to increase gradually the temperature of the water from the latter degree, and not to exceed 45 degrees C. (113 degrees Fahr.), in order to obtain the most perfect proofs from a given negative. Indeed, by placing the

supports for development of the image on a rack and immersing the whole in water heated to, say 35 degrees C. (95 degrees Fahr.), the image will develop itself to perfection in a certain period.

Now, the second defect, white and black prints—from good negatives of course—results from the direct insolation to sunshine, unless the printing frame be covered with several thicknesses of transparent paper to subdue the intensity of the luminous action. It is a well-known fact that the parts of the gelatine film corresponding to the half tones are not sufficiently impressed in comparison to the blacks while printing by sunshine in this as well as, in the collotype, photogravure and other gelatine processes, because the luminous action through the bare glass (dark shadows) of the negative, and the parts less intense (half blacks) is more energetic in proportion than through the others, the result being that the corresponding parts being most acted on are made insoluble deeply through the thickness of the film and then require to be clearer by a treatment with water at a higher temperature than the parts representing the half tints—which are but superficially and slightly insoluble—can stand.

As to the want of intensity in the blacks, and of general vigor or brilliancy, the objection does not stand. Not only can the picture be intensified *in toto*, but local intensifications can be made with the greatest ease. Even the image can be dyed with various colors, generally or locally, by chemical means. On this subject the reader can consult the BULLETIN of 1877, and our paper, "The Carbon Process," in the first volume, No. 9 (1889), of the "Science of Photography," published by James W. Queen & Co., of Philadelphia.

In concluding, the writer—an enthusiastic *charbonnier*—cannot refrain from enumerating some of the many advantages of the process.

The carbon prints are absolutely permanent. We have specimens we made in 1865 with Swan's tissue, worked by the method then in use, together with others made ten years later by the process improved by Johnson and Lambert, and every proof, without exception, is as fresh as the very day it were printed. But this is not a wonder, for amongst the simple elements carbon alone withstands the action of the atmospheric influences and those of the chemicals acting on the metals proper.

For diapositives, the process is the best and most simple yet found. The proofs are perfect, without loss of gradation, and can be used for the lantern or to make duplicate negatives or enlargements, the former by contact printing on the tissue, just as diapositives.

Carbon diapositives are now used to impress the gelatine film in photogravure. They are also employed to etch through them in intaglio or in half tone relief, or copper and zinc plates.

The proofs can be intensified or dyed in different colors, as stated above. Their intensity can also be reduced at will by a strong and warm solution of sodium, magnesium, zinc or other chlorides, and the dye may be dissolved or lightened by well-known chemical means.

Lastly, they can be colored from the back by the albumen colors of L. Encausse. And, if the image has been developed on the glass plate as a final support, then so colored, then backed with plaster of Paris tinged with orange to break the crudity of the whiteness of this substance, a pretty picture is obtained—not very artistic of course, but by far more acceptable than those abominable life-size bust crayons sold all framed for \$8 or \$10 and often given away to the originator of the club.

I know it is not likely that professional photographers will go back to the carbon process, for the printing out silver salt method is simple, expeditious, yields very fine proofs and can be learned in a week. Moreover, at the price photographs are made now-a-days in some establishments the photographer does not care a straw whether the image will fade or not. As to the amateurs—the real amateurs—the case is quite different. They want to make the best pictures and want them to be permanent. What is the use of making something that disappears in a certain period? It is wasting precious time. No doubt that ere long they will adopt for printing either the carbon or one of the photo-mechanical processes, not excluding photogravure, as do many of the English and French amateurs.

[From *Photographisches Archiv*.]

THE CAUSE OF THE DECOMPOSITION OF EIKONOGEN.

By numerous experiments, M. Mercier has discovered that the principal cause of the decomposition of eikonogen is to be looked for in the crystalline water contained in the product, the eikonogen containing of the latter the significant quantity of 10 per cent.

If this water is extracted from the eikonogen by methodical evaporation in the drying oven, it will not change, provided it is not exposed to moisture and is kept in bottles or metallic cases. It was asserted that eikonogen, as originally manufactured, can be easily influenced by iron; but this is a mistake, metals exercising in no manner an influence upon eikonogen when the same is completely free from water.

If this substance is not very dry, or if through any change in temperature the water contained in the crystals is liberated, it will decompose the eikonogen, which, as known, is the soda salt of the amido-naphthol-monosulpho-acid, and ammonia will form, which causes the oxidation of the whole mass. The same becomes green and gives a dark green solution if the product is alkaline; it will become pinkish red and give a dark pink-violet solution when the product is weakly acid. If the ammonia is capable of liberating itself, the eikonogen will keep much better.

From a practical point of view, the following conclusions may be drawn:

First.—Completely dry eikonogen keeps easily without any change; it is therefore desirable that the same should be furnished by the manufacturers as much as possible free from water.

Second.—In warm and dry places the eikonogen will keep better in wooden or paper boxes than in closed vessels.

Third.—In bottles or water-tight boxes the eikonogen, not dried, should be kept in a cool place and be protected against heat and changes of temperature.

[From *Deutsche Photographen-Zeitung*.]

PRACTICAL REMARKS ABOUT DIFFUSION.

BY L. BELITSKI, *Nordhausen*.

It may not be out of place to make a few short remarks about some diffusion proceedings in photography and their practical application. Before I do so, I would like to explain the nature of diffusion.

By diffusion we understand the tendency of gases, and also liquids, which

do not react chemically to penetrate each other, or to mix without the influence of mechanical powers.

Some examples will make this more comprehensive:

Two sound glass balloons of 27 c.m. capacity each, one filled with hydrogen, the other with carbonic acid, which is twenty-two times heavier than the former, were connected vertically, the hydrogen on top, by a glass tube 26 c.m. long and 5 m.m. wide. After twenty-four hours both balloons contained the gases, equally mixed. A part of the much lighter hydrogen had therefore found its way downward, while a corresponding volume of carbonic acid had gone upward. Carbonic acid and atmospheric air mixed likewise, if the latter was brought in place of the hydrogen; but, although the difference of their volume weights is much less (carbonic acid is only one and a-half times heavier than atmospheric air), it took seventeen days to bring about a uniform mixture. The reason for this is in a particular property of the gases, the so-called diffusion power which is particularly prominent in hydrogen. The diffusion proceeds also through porous separation walls, for instance plaster of Paris, unglazed clay, bladder, rubber skins, etc., which, in practice with balloons, for instance, has to be carefully considered.

With liquids the mixture (hydro-diffusion) contrary to gravitation, proceeds much slower than with gases.

If both liquids are separated by a porous separation wall the gradual exchange is called endosmose and exsmose, and the rule is that the thinner, lighter and less concentrated liquid has the tendency to dilute the concentrated. This oftentimes takes place with mechanical power, as, for instance, in the bubble formation on albumen paper, and expands the same.

But we have also to consider always in the manifold diffusion proceedings taking place in photography, the different specific gravities of the gases, vapors and liquids, and should not disregard the tendency of the bodies to follow gravitation. This is overlooked quite often, and even against our own interest.

I will mention here some practical examples:

Notwithstanding the tendency of the gases to diffuse they will follow gravity, however, first of all principally in the proportion of their volume weights, which is greater and acts quicker than diffusion. Liberated gases or vapors which are lighter than air will at first move upward; heavy ones, on the contrary, will go downward, while at the same time, according to this diffusion power, they will mix with each other more or less quick and completely. I would call here particular attention to the great difference in the specific gravity of ether, alcohol, petroleum, benzine and ligroin, vapors, etc., on the one hand, and the atmospheric air on the other hand. These vapors at first go quickly downward, where they collect. In working with these liquids by lamp light it is, therefore, necessary to place the light pretty high so as not to be exposed to great danger, and to avoid fire and explosion.

During a conversation with some friends about chloride of silver collodion—and albumen paper—none of them had any idea about the great weight of alcohol and ether vapors, and that, to avoid ignition, it was imperatively required to place the light high and to provide for the proper outlet of the ether vapors.

I illustrated this fact by a very simple experiment: A gutter of tin, wood or pasteboard, about 1 m. long, 8 to 10 c.m. wide, and about 5 c.m. high, is placed on the table at an angle of about 20 degrees from the level, the lower

end extending somewhat beyond the table. If a tuft of cotton of the size of a walnut, saturated with ether or benzine, is now placed in the upper part of the gutter, where the air is undisturbed, and those present cause not the slightest draught, the heavy combustible vapor which has developed will flow down the gutter like water and will ignite at once if a light is held on the lower end of the gutter, while the light is almost four times closer proximity to the center tuft at the upper end of the gutter effected no ignition.

It is just the reverse with hydrogen; it, or air mixed with the same, is essentially lighter than pure air, and therefore will at first move upward. This is the reason why most objects will dry much quicker on the upper side.

This fact should also be considered. In washing of positive and negative pictures, where we have salt solutions, the gravity of the latter acts more eminently and much quicker than the diffusion power, which has also to perform its mission in the porous films of the paper or gelatine skins. After the secretion of the salts from the porous media into the water we have to give them an opportunity to follow the gravity and sink below by placing the films to be washed out face downwards, or the plates vertically to have a continuous stream of fresh water wash the films and remove by diffusion so much quicker and more completely the injurious salts, because the larger the difference in the concentration of the salt solutions in and outside of the film, the more likely and quickly the exchange will take place.

Considering this, I could never comprehend why the influx of water to the washing boxes for negatives was at the bottom and the discharge always at the upper part.

A manufacturer of these boxes, to whom I expressed my opinion about this, asserted, practical use had proven, that in this manner the negatives were washed much quicker than if fed with fresh water from above and having the discharge pipe at the bottom, the heavy stream keeping the water in constant agitation. The same opinion has been expressed by a celebrated author, and I considered it therefore sufficiently important to practically test this method of washing and determine the truth. It seemed to me impossible that theory and practice could contradict each other, as with an upper influx the sinking parts of the salt would be removed from the box at once while the fresh stream of water from below would mix them continuously again with the water in the box.

I had two tin boxes made of equal size, in which I could wash vertically one or two negatives; one of the boxes had the feed-pipe on top, the other at the bottom, and the discharge pipe was diagonally opposite to the influx. The plates did not touch the bottom, but remained at a distance of 1 c.m. from the same; the influx was horizontally, so that a disturbance of the water was avoided as much as possible; the lower discharge pipe was fixed so high outside of the box that a voluntary emptying of the box could not take place, but that only as much water was discharged from below as was added from the top.

Into those two boxes with equally regulated water influx I placed simultaneously two bromide of silver gelatine plates after fixing. They were washed, and the discharged water was tested every five minutes for fixing soda. After the first and second five minutes no essential difference could be observed, but very soon afterwards it could be observed in favor of the box with the upper influx and lower discharge. After an hour, after each box had discharged about

four times its capacity, the water in the box with the upper influx showed no more reaction for fixing soda, while the water discharged from the top of the other box showed very distinctly the presence of fixing soda. The result remained the same when the influx and discharge were interrupted periodically, so that the plates could stand quiet in the water for some time. Only after double and even triple use of water, and proportionally longer time, the fixing reaction ceased in the case which had its discharge on top. This test was repeated several times with the same result. The opinion that the lower influx of water into washing boxes acted superior and quicker than the upper influx is therefore shown practically and theoretically as erroneous, and for the future the negative can be freed surer and in less time from the injurious chemicals with less water than heretofore. The upper influx has also the advantage that newly fixed negatives can be added in the box to the already almost washed ones without detriment to the former, although it will certainly take place in the reversed case.

The tests for presence of fixing soda were made very simply by means of nitrate of silver. 1 or 2 c.m. of a 2 per cent. silver solution, acidified with acetic acid, were put into a beaker glass of the size of an ordinary tumbler, and the glass filled with water to be tested. A $\frac{1}{100000}$ part of soda in the water will color it brown in about ten to thirty seconds; at $\frac{1}{1000000}$ the reaction is still distinctly yellow; but at one millionth part nothing can be observed.

One one hundred thousandth of fixing soda is therefore still distinctly shown, and this is fully sufficient for practical purposes, and if after cessation of the reaction the washing is continued for a short time, the gelatine film will be completely clear.

The test upon hyposulphite of soda with iodine and starch is more sensitive, because a millionth part can be proven, but it is too complicated and is therefore not applied practically. However, it may still be remarked, that besides hyposulphite of soda, a great number of other bodies, as, for instance, alkalies, alkaline earths, cyanide of potassium, sulphurous salts, pyro, etc., discolor the blue iodine and starch, so that the reaction is not certain in spite of its sensitiveness.

The test with nitrate of silver, on the contrary, is very simple and certain, and only, if the washing water contains compounds of chloride, the quantity of the silver salt has to be increased sufficiently that not all the silver is precipitated. If fixing soda were still present, one obtains a more or less yellow to brown colored precipitate; at total absence of the fixing salt the precipitate will then be a pure white chloride of silver. Those who have no running water at disposal have to change the water in the dishes or washing boxes. A renewal of the water four or five times at intervals of a quarter to half an hour is sufficient. I would also call here once more attention to the fact that plates washed in dishes or trays absolutely have to be put in with the film side down; face up the diffusion alone can remove the superfluous fixing salts after a very long time and frequent changes of water; the diffusion must also be assisted here by effecting the immediate precipitation of the salts leaving the film.

The washing-hooks recommended by me some time ago seem to be not much known yet, and I will therefore repeat here a description of the same:

Bend a piece of copper wire 2 mm. thick to an open square with a side length of 10 to 20 c.m. The side opposite the open space is formed to a broad

hook by bending the two wings, which is hooked over the edge of the washing dish, so that both wings come to rest at the bottom of the dish with their ends—in a diagonal line towards the edge. Two such hooks at opposite edges of the tray serve therefore to a reversed plate as supports at the extreme edges, so that the film remains untouched. By bending of the wings any desired height above the bottom of the tray can be given to the plate. The copper wires can be applied for different trays and plates.

Negatives washed as above will never turn yellow, and keep otherwise very well if properly intensified when required. Complaints about this defect prove that the washing has not been sufficient.

[From the *Photographic Review*.]

MAKING OF MATT-SURFACED GLASS BY ETCHING WITH FLUORINE COMPOUNDS.

MATT-SURFACED glass, in which the roughening is very fine, has several uses in photography, and by the etching method, as given in detail by Lainer, a surface can be obtained in which the graining is very much finer than can be produced by grinding, and for such fine focusing-screens as are required in special scientific work there is considerable advantage in using the etching glass surfaces.

Lainer's method of operating is as follows: The glass is first cleaned with the same care as is required in preparing a plate for the wet collodion process, after which it is bordered with wax, and when set on a leveling stand the plate is flooded with dilute hydrofluoric acid, made by mixing one part of the commercial acid with ten of water; this acid being allowed to remain on the plate for about a minute. The object of this preliminary etching is to produce an absolutely clean surface. The acid is now rinsed off, and the plate is wiped with a soft and carefully-cleaned sponge.

The plate is next leveled, and the matt-etching preparation is poured on. This etching preparation is made as follows: In a suitable vessel—wood lined with asphalt is recommended—is poured enough strong hydrofluoric acid to fill it not more than one-fifth full, and powdered crystals of sodium carbonate are gradually stirred in until the mixture becomes thickish and hangs like snow on the stirrer, which stirrer may be a strip of wood soaked in shellac varnish and dried. The white foaming mass is at this stage strongly acid. It is advisable to perform the operation of partial neutralization out of doors, not only on account of the irritating nature of the fumes (carbon dioxide saturated with hydrofluoric acid), but also on account of possible damage to lenses or other polished glass surfaces.

The pasty mass of fluoride of sodium and hydrofluoric acid is now diluted with water, from five to ten times its volume being required, according to the degree of concentration of the original acid. The best way is to begin with the smaller proportion of water, and to etch a trial piece of glass by leaving the liquid in contact with it for two hours. If the etching gives a very close, fine grain, all is right; but if, on the other hand, the grain is coarse, unequal, and almost crystalline in appearance, further dilution is required.

When the dilute preparation is so weakened by use that it acts slowly, a little more of the pasty soda mixture may be added. In etching the plate, cleaned as already described, a layer of liquid, from a quarter to half an inch deep, is required. When the etching is complete the plate is rinsed and scrubbed with a hard brush to remove an adhering film of decomposition products.

THE PRIMULINE PROCESS IN ACTUAL PRACTICE.

NEW DEVELOPING AGENTS—PRODUCTION OF INK-BLACK TONES.

THIS method of photographic printing—a method more especially adapted for the production of photographs upon textile fabrics—was made public at the recent meeting of the British Association for the Advancement of Science, and we have already published such particulars as to give our readers a general knowledge of the method. What has hitherto been made public has been largely calculated to mislead rather than to instruct, especially the erroneous statement as to the exposure being made on cloth simply dyed with primuline; this misstatement having not only appeared in several newspaper reports of the British Association meeting, but it was also actually reproduced in the editorial columns of one technical publication.

We did not attempt to deal exhaustively with the matter, either on the strength of such vague reports as we received from Leeds during the session of the Association, or on the somewhat scanty information which we could gather from the paper of Messrs. Green, Cross & Bevan, and from Mr. Green's recent demonstration of the process before the Photographic Society of Great Britain, especially as on this latter occasion Mr. Green showed but little inclination to enter into the chemical questions involved, or to go beyond the limits of his pre-arranged demonstration, he probably considering that in an assembly of photographers scientific details would be considered tedious or out of place. As a matter of fact, we noticed that there were several chemists present who have made an especial study of the benzene derivatives, and we fully expected a discussion of interest.

Primuline, as sold by Messrs. Brooks, Simpson & Spiller, of Hackney, is the sodium salt of the sulphonic acid derived from a base which appears to be dehydrothio-toluidine, or a condensation derivative of this amine. This new color of the coal-tar series is now used as a starting-point in producing several tints on calico, and although it is not necessary for us to enter into any elaborate discussion as to the chemical constitution of the benzene derivatives, we may point out that the new body can be regarded as a derivative of cresol, C_7H_7HO , the next homologue above phenol or carbolic acid; or one may regard it as a substitution and condensation product of toluidine, $C_7H_7H_2N$, the base standing next above aniline in the homologous series—methyl-aniline, in fact, $C_6H_5CH_2H_2N$. Just in the same way cresol may be regarded as a methyl-phenol, $C_6H_5CH_2HO$. A sulphonic acid may be looked upon as sulphuric acid, SO_2HOHO , in which one of the hydroxyl groups, HO , is replaced by a monovalent radical. Thus, phenyl sulphonic acid would be $SO_2C_6H_5HO$; but in the case of a divalent radical like ethylene, C_2H_4 , two of hydroxyl in two of sulphuric acid are replaced, and we obtain ethylene di-sulphonic acid $(SO_2HO)_2C_2H_4$. Sulphonic acids can be obtained by several generic reactions, the most common of which is heating the hydride of the radical with ordinary or fuming sulphuric acid. As an example, we may refer to the production of phenyl-sulphonic acid by the reaction of benzene and sulphuric acid—thus, $C_6H_5H + H_2SO_4 = SO_2C_6H_5HO + H_2O$.

We propose now to give working details of the primuline process as applied to the production of prints on calico, but the same details will serve for working on paper if the difference in texture be taken into account, and the manipulation be modified accordingly. At the same time we may remark that there appears but little inducement to use primuline for paper prints.

A hundred and fifty grains of commercial primuline are heated to the boiling temperature with 10 ounces of water, a glass flask or beaker heated on a sand bath being used. The liquor is now poured off from any undissolved matter, on sheets of calico laid in a porcelain dish, the above quantity of dye being sufficient for sixteen pieces of rather thin calico, whole-plate size. When in the dye, the sheets should be constantly turned over one by one, as in toning prints,

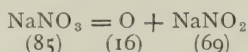
and if kept moving in the warm dye for ten minutes they will be sufficiently stained. The dish should be kept warm during the operation of dyeing.

When ordinary calico from a draper's shop is used, it is necessary to boil it in water and thoroughly knead or "dolly" it to remove the dressing, a troublesome operation, which is avoided when one can obtain clean calico from a print works.

The dyed calico is now rinsed in water, wrung out, and the pieces are immersed singly in the following solution, the quantities being reckoned for the sixteen pieces, whole-plate size :

Commercial nitrite sodium	100 grains.
Commercial hydrochloric acid.....	$\frac{1}{2}$ fluid ounce.
Water.....	36 ounces.

The nitrite of sodium can be obtained from an operative chemist, or it may be readily prepared in a sufficient state of purity by heating nitrate of sodium to a low redness in a silver or porcelain capsule till the loss in weight is a little more than corresponds to the reaction.



Care must be taken that the nitrite is quite dry when the first weighing is made.

Under these circumstances the primuline in the cloth will rapidly change into a corresponding diazo derivative, the fabric taking at the same time a reddish-brown tint. It is now sensitive to light, exposure serving to destroy the azo derivative, and so prevent its reaction with certain "developers," and it will thus be seen that the process is one giving a positive from a positive.

The pieces of cloth should be turned over a few times in the nitrite bath, and they are then rinsed several times in water to remove the free hydrochloric acid; after which they are laid in a blotting folio to dry. Overdrying with heat is undesirable, as tending to lower the sensitiveness, and, moreover, it would cause any trace of hydrochloric acid to react on the fiber.

The exposure is perhaps rather less than for ordinary albumenized paper, and its progress is indicated by the bleaching of the reddish-brown azo body to a dingy yellow; and to get the full vigor which the method is yielding, it is necessary to have originals which are somewhat denser than are required for most other analogous copying methods. Indeed, we may at once say that the method appears to us to be more suitable for copying from very dense tracings, or such opaque objects as leaves and twigs of plants, than from ordinary half-tone positive transparencies, or the comparatively light tracings which are often employed in making reproductions by the Pellet process (cyanosfer). When the sensitive material permeates the whole substance of the support, as in the case of cloth sensitized as now directed, it is extremely necessary that the original should be dense and opaque in order that the light may decompose the sensitive azo body all through the substance of the fabric; should, however, the original not be so completely opaque as to allow of this, it is an advantage to give the back of the cloth a short exposure to light—say, equal to one-fifth or one-sixth of the total exposure. This clears the ground at the back, and does not sensibly affect the vigor of the image. Before development, it is well to thoroughly wet the cloth and wring out the excess of water, otherwise, in order to secure equal action all over, it may become necessary to wring it out while saturated with the developer—a course not always agreeable, especially when the naphthylamine developer is used; this base having a very persistent and characteristic odor, which Dr. A. W. Hofmann used to describe in his lectures as "agreeable and resembling narcissus," although one of the newspaper reporters of the recent British Association meeting characterizes the odor simply as "evil."

The following developers have, among others, been indicated by Messrs. Green, Cross & Bevan, although as far as we know they have given no definite instructions for compounding developers, an omission which we now supply.

DEVELOPER FOR RED.

Beta-naphthol.....	40 grains.
Caustic soda or potash.....	60 “
Water.....	10 ounces.

The alkali is dissolved in a small quantity of the water, rubbed up in a mortar with the naphthol, and the rest of the water is now added.

DEVELOPER FOR ORANGE.

Resorcin.....	30 grains.
Water.....	10 ounces.

Dissolve and add

Caustic potash or soda.....	50 grains.
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DEVELOPER FOR PURPLE.

Alpha-naphthylamine (ordinary naphthylamine).....	60 grains.
Commercial hydrochloric acid.....	1 fluid dram.

Mix the naphthylamine and the acid in a mortar and add

Water.....	10 ounces.
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Other developers containing phenols, amido-phenols, and alkaline salts of sulphonic acids of phenols have been indicated by Messrs. Green, Cross & Bevan, but it is sufficient to give the above selection of developers compounded from ingredients to which they refer. The strangest thing, however, is that we cannot find any mention of the use of such benzine derivatives as are strictly in range with the chemicals they indicate, and are now in every-day use by photographers for developing purposes. We allude more especially to the sodium salt of amido-beta-naphthol-beta-monosulphonic acid which is sold under the name eikonogen, pyrogallol acid or pyrogallol, and hydroquinone, two of which, at any rate, we find not only to have a powerful developing action on the azotized primuline image, but to possess very evident advantages over the developers made with the ingredients indicated by Messrs. Green, Cross & Bevan—advantages so notable that for much of such commercial work as the method is capable of they will probably be employed to the exclusion of others.

The following are the developers made up with “eikonogen” and “pyro” respectively.

DEVELOPER FOR INK-BLACK TONES.

“Eikonogen”.....	60 grains.
Water.....	10 ounces.

Grind the eikonogen in a mortar, add the water, put in the exposed cloth, and keep all in motion till the development is complete. In this case the dissolving of the “eikonogen” and the development of the image proceed simultaneously. The white crystallized “eikonogen” should be used.

DEVELOPER FOR BROWN TONES.

“Pyro”.....	50 grains.
Water.....	10 ounces.

In every case the full density is completely brought out by the developing solution in a few minutes, and the development being finished no fixing is necessary, mere washing being required to remove such soluble chemicals as remain; but after rinsing it is desirable to wash in soap and water, as this serves to clear the ground somewhat and brighten the image. Ironing between sheets of paper, best done before the prints are absolutely dry, is desirable.

We experience especial satisfaction in having given particulars of a developer capable of producing the ink-black tones which were referred to as so desirable when the primuline process was brought before the Photographic Society, and we would point out that whatever patent claims Messrs. Green, Cross & Bevan may have on the process generally, it is quite difficult to suppose that such claims can cover the use of the “eikonogen” developer, unless indeed this agent is distinctly specified in some claim not yet published. It may be pointed out

that no general claim, such as "phenol derivatives" or "aromatic sulphonic acids," can be valid unless everything included under such heading will serve the purpose. We may incidentally mention that we have experimented with other developing agents than "eikonogen" and "pyro," among which we may mention orcin (a substance homologous with the resorcin used by Messrs. Green, Cross & Bevan) and catechu; but we do not consider these to have such definite advantage over the developers indicated by Messrs. Green, Cross & Bevan as to justify our giving them that prominence we have given to "eikonogen" and "pyro."

There is much yet to be said about the various applications and modifications of the primuline process, especially as regards the fastness to light of the various tints. We are now making experiments which seem calculated to cast a completely new light on the method.

THE AUTOMATIC OPERATION OF PHOTOGRAPHIC APPARATUS.

BY PROFESSOR D. P. TODD.

[Read at Washington Convention.]

THE need of automatic instruments has been more keenly felt in the prosecution of eclipse research than in any other department of scientific investigation where photography is an adjunct. I refer, of course, to the work which goes on during the total phase of a solar eclipse, which is usually only two or three hundred seconds in duration, when the great variety of special problems necessitates a variety of instruments correspondingly great, and when the startling phenomena of the critical moments often occasion the hand to fail in executing a well-rehearsed programme.

At the last total eclipse, visible in Angola the 22d of December, 1889, a novel combination of apparatus was for the first time brought into operation; and although clouds prevailed during totality, thus precluding the possibility of photographing the solar corona, the working of the apparatus was so successful that a description of it will not be without interest in view of its possibilities in eclipse work in the future.

In equipping the U. S. Eclipse Expedition to West Africa, I recognized three essentials: (1) a great variety of instruments; (2) large scale pictures of the corona; (3) the necessity of perfect clock-work. I saw no better way to meet these conditions than by constructing an equatorial mounting sufficiently capacious to accommodate all the photographic apparatus. Accordingly, a split polar axis was built of 6-inch wrought-iron tubes, about 11 feet long, and placed 2 feet apart. The whole was mounted, English fashion, on massive cast-iron supports, capped with brass bearings. This was built by Mr. Saegmueller, of Washington, and I was fortunate in obtaining from him the loan of a very perfect and powerful clock-work to drive it. This latter was in process of construction for the great equatorial refractor of the Denver Observatory; and I found its centrifugal governor, a triple-twist flexible steel spindle, to perform with the highest accuracy. Also, the means provided by Mr. Saegmueller for adjusting the polar axis into parallelism with the earth's axis proved to be very neat; and the adjustment was readily made so close that, with an hour's run of the clock, the declination error on the plate did not exceed 20 degrees.

On this axis was mounted all the photographic apparatus for the total eclipse, and a high-power directing telescope to verify the pointing of the whole.

This comprised the following apparatus:

First.—Professor Pickering's reversing-layer spectroscope for photographing a spectrum-trail for fifteen seconds both before and after second and third contacts.

Second.—Five photographic telescopes, the first a Clark 150/8 doublet, twelve exposures, two being through a Carbutt orthochromatizing screen; the second a Dallmeyer 38/6 portrait lens, sixteen exposures; the third a Dall-

meyer 24/6 portrait lens, four exposures; the fourth a Ross 42/5 portrait lens, eighteen exposures; and the fifth, a Gundlach 22/3.75 aplanatic orthoscope, with one specially prepared plate for the extreme outer corona, and other circum-solar objects.

Third.—Two catoptric telescopes by Brashear, with twenty-five exposures for each, the first having the ratio 33/8, with the central 3 inches of the mirror sacrificed to the plate-holder, while in the second, 72/8, the entire aperture was made available by setting the plate-holder at one side of the tube and tilting the mirror slightly, as in the Herschelian form of mounting.

Fourth.—Five dioptric telescopes, with objectives uncorrected for the actinic rays, the first a Clark-Merz 96/6.4 objective, twenty-five exposures, of which five were made with the full aperture, and five each with apertures of 5, 4, 3 and 2 inches; the second, a Schroeder, 22/6 triple objective, one hundred exposures; the third, a Clark, 72/5 telescope, with the sun's image enlarged to 4.5 inches diameter, four exposures; the fourth, a Spencer, 36/4 objective, eighteen exposures, divided among apertures varying from 1 to 4 inches; the fifth, a Clark, 49/3.5 objective, twenty-five exposures. This latter instrument was intended to provide pictures precisely comparable with those of the eclipse of 1889, January 1st, taken by Mr. Barnard, and accordingly the aperture of the objective was capped down to 1.75 inches.

Fifth.—Two flint glass spectroscopes and one quartz spectroscope.

Sixth.—Two duplex cameras for photographing the polarization of the corona.

Seventh.—A duplex telescope of 75 inches focal length for coronal photometry.

The finder or directing telescope was a 7 $\frac{1}{4}$ -inch Clark refractor, with a high-power eye-piece.

In all, the apparatus mounted upon the polar axis embraced two mirrors and twenty-three objectives.

The operation of it by hand, as ordinarily, would of course have been impossible. My experience during the eclipse in Japan two years previously had suggested the desirability of automatic operation of all eclipse apparatus; and as a result of such experimenting with different electric and pneumatic devices, I finally ventured to adopt the pneumatic valve system covered by the letters patent of Mr. Merritt Gally.

By means of this unique and ingenious system, which has been largely employed in the automatic playing of musical instruments, a very small current of exhaust air, say of $\frac{1}{10}$ -inch diameter, is made to control an exhaust current very many times greater in volume.

A system of forty-eight such valves offered no difficulties of construction whatever, and was built in ten days' time, under the immediate personal supervision of the inventor. The tubes leading from the valve-ports were of $\frac{1}{2}$ -inch diameter. The control currents were governed by a succession of $\frac{1}{10}$ -inch apertures punched in a strip of paper about 9 inches wide and 7 feet long. This I wound upon the barrel of an ordinary chronograph, so that it should unwind at a perfectly uniform rate when the chronograph was set going. As the paper left the barrel it passed over the "tracker" and was re-wound upon a take-up roller. The whole was mounted over an exhaust organ-bellows, strongly built, and with springs of triple tension. This combined apparatus made a perfect pneumatic commutator, having forty-eight air-currents in perfect control. In order to set any current in motion, it was only necessary to puncture the control-sheet at a point whose x was equal to the time, and whose y corresponded to the number of the air-port in the "tracker."

From the commutator, $\frac{1}{2}$ -inch lead pipes were run to the position of the different mechanical devices which were to come into action during totality. Here they were connected with small pneumatic bellows of the ordinary V-pattern.

Each bellows, then, was so connected by appropriate mechanical movements that its collapsing-thrust should perform the various sorts of work required,

whether the operation of an exposing shutter, the revolution of a nickel, the variation of available aperture, or the shifting of a photographic plate.

In such a variety of apparatus it was impossible that one form of mechanical movement should suffice for the whole. The requirements of some of the instruments were best met by shutters which the pneumatic bellows held open against the action of a spring during the full length of the exposure; while others required that alternate actions of the pneumatic should open and close the shutter, or exposing-slide. This was easy enough; but the problem of changing the sensitized plates for new exposures turned out to be much more difficult, especially where a large number of exposures was required.

Where the plates were small and the exposures few, a sliding plate-holder was found to work best; here it was only necessary to fasten a ratchet to the back of the plate-holder and then attach a paul to the vibrating side of the bellows. But some of the plates were of the size 17 by 20 inches, and they could not be advantageously managed in this way. I finally hit upon the idea of attaching them to a revolving crate or barrel, set in motion on its axis by means of a small weight fastened to a cord wound upon a pulley or wheel at one end. The whole was then rigged escapement fashion, with detents equal to the number of plates, and each detent so adjusted that when at rest its corresponding plate lay in the focal plane of the objective. A very small pneumatic then sufficed as a pallot, or as a trigger to set off the mechanical device on the conclusion of each exposure. This simple movement was found to be sure of action, easy of construction and to require a minimum of time for shifting the plates.

Also, the capacities of other devices for shifting plates were tried. At the focus of one of the smaller instruments a plate was set in a small frame sliding laterally in a frame of twice its own dimension, and this latter again sliding longitudinally in a shallow box of twice the dimension of the outer frame. By means of three pneumatic bellows, appropriately set and fitted with ratchet-movements, every part of the sensitive plate was brought to the center of the focal plane, and the exposure duly made.

For the reflectors, it was found best to employ an endless chain or bolt of plates, double-hinged together by means of continuous flexible tapes.

In order to test the utmost capacity of the automatic apparatus, and at the same time to furnish a large series of pictures of the same corona with a given instrument, a quick-acting lens was rigged with a long plate-barrel, sliding automatically forth and back in a frame rigidly attached to the tube. The barrel had ten plate-strips upon it, and the ratchet movements gave ten exposures for each strip. In this manner one hundred exposures, from a half second to two seconds long, were readily obtained with a single instrument.

In order to avoid the construction of a camera-box for each telescope, I adopted the plan of mounting the polar axis near the middle of a large Ducker portable house, one end of which had a removable roof, while the other formed a dark-room. The spaces between all the instruments in the axis were readily stopped, and a partition athwart the house was built up underneath the axis and down from the rafters of the house. It was then a simple matter to connect the partition with a wooden frame around the exterior of the polar axis by means of heavy opaque cloth, secured to the partition and the frame, with sufficient slack to allow the necessary motion of the polar axis and all the instruments mounted on it.

It may be further stated that substantially all this apparatus was devised, constructed and tested at sea, during the voyage of the United States Steamship *Pensacola* from New York to Saint Paul de Loanda.

Notwithstanding the evident impossibility of securing any pictures of the corona, as a thick cloud stood nearly stationary over the sun at the time of totality, the pneumatic commutator was brought into operation, and the controlling chronograph set going fifteen seconds before the predicted time of second contact. The duration of totality was 190 seconds, and over 300 exposures were made. The automatic movements of exposing-shutters and the other

apparatus in the uncovered portion of the house were apparent ; while in the absence of pictures on the plates, the accurate registration of the movable plate-holders was rendered certain by the subsequent examination of marks so placed upon the slides and revolving barrels as to disclose any failure of the mechanism to act.

After many months of experimenting, it may now be said that the automatic operation of a large amount of photographic apparatus simultaneously has been carried beyond the experimental stage. Many of the mechanical applications which operated successfully at Cape Ledo might evidently be covered by letters patent, but their use will not be so restricted. The simplicity and directness of the methods employed leave little to be desired, while the moderate expense of the apparatus puts it within easy reach. Of course, the equal facility of its application to the automatic working of every sort of physical apparatus will not escape notice.

DEVELOPING.

BY G. HANMER CROUGHTON.

[Read before the Washington Convention.]

As I understand it, a paper to be read before the members of the Photographic Association of America should be short and suggestive rather than exhaustive—in fact pegs to hang discussions upon ; therefore I will plunge into my subject without preface.

During the past year there has been little change in methods of development. Pyro still stands as the favorite, although several substitutes have been used and suggested.

Eikonogen has advanced in favor, many of the dry plate makers giving eikonogen formulas for use with their plates. I have used it with great success in short exposures, and my experience with it is, that you can afford to give one-third less exposure than for pyro, and I feel sure that one cause of the complaint, that sufficient intensity cannot be obtained with eikonogen, arises from over-exposed plates and new developers, for a plate exposed for pyro development will be over-exposed if developed with freshly mixed eikonogen. This was proved to my entire satisfaction upon some Eastman films exposed in a No. 2 Kodak on Decoration Day, when the light was very bad for snap-shutter exposures.

The first twenty exposures were developed with the potash pyro developer, known as Hoover's developer, a developer which I have handled most successfully upon all kinds of exposures, but they proved so hopelessly under exposed that I put the other part of the roll aside, thinking it was not worth the trouble to develop them ; but Dr. Weigal, one of the members of our Camera Club (an ardent experimentalist), brought me some eikonogen developer he had mixed, and I developed the rest of the films and got at least one-third more out of them than I got on the first twenty with pyro development, and some of them (all things considered) making good printing negatives. Dr. Weigal's formula for mixing the eikonogen developer is: 48 grains of eikonogen is dissolved in hot water; add to that 2 ounces each of a solution of sulphite of soda (hydrometer test 60) and carbonate of soda (hydrometer test 45), then add enough water to make up 8 ounces in all. For over-exposure this developer can be restrained with bromide of potassium, the same as pyro. For snap-shutter exposures this is the best developer I know.

The potash pyro developer (Hoover's) I have referred to is too well known to need the formula being given here, but I would again call attention to the method of using the sulphite of soda. In the majority of formulas it is divided between the pyro solutions and the potash or soda solutions. This is wrong in both theory and practice. If it requires 4 atoms of sulphite of soda to 1 atom of pyro to get the best effect from both, then it stands to reason that

the whole of the sulphite should go into the pyro solution. If you could always be sure of using exactly the same amount of each solution, then it might be divided, but even then there would be no advantage in dividing it; but where different exposures and subjects require, first, more soda and then more pyro, the balance of 4 to 1 is being continually upset.

Why is it that so few photographers on this side of the Atlantic use liquor ammonia as accelerator instead of potash or soda? There are a few, and those few among the best-known names who produce high-class work, who do use it, but they are the exceptions.

The deposit caused by ammonia is exceedingly fine, the softness and gradations everything that can be wished, and you can get more out of a given exposure by ammonia than by any other alkali. But few photographers like the color of the deposit, which is greenish gray, and they are generally deceived by the apparent thinness of the negative. But I think if photographers would only get over the idea that they want their dry-plate negatives to approach as near as possible in color to a wet plate, they would find many advantages in the use of ammonia. For copies for enlarging upon bromide papers there is nothing can beat an ammonia developed negative.

If photographers want a wet-plate color and effect, why do they neglect the oxalate developer? Many German and French photographers of the highest rank have used oxalate from the first, and still continue to use it. With a full-bodied plate—that is, one rich in silver bromide, and particularly one which contains a small proportion of iodide of silver, the oxalate developer gives fine results, and the old wet-plate man can delight his eyes with a negative which very nearly resembles a wet collodion plate. In many cases I have been able to use oxalate upon a plate that with pyro has been hopelessly spoiled by green fog.

A NATIONAL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE Syracuse Camera Club, by resolution dated August 8, 1890, authorized the issue of a brief address to the amateur photographic societies and clubs of America, calling their attention to the desirability of a national organization of those interested in photography, either practically or in its purely scientific relations. No further reference was made to the special objects of such a National Association, but the circular was thrown out as a germ thought around which might crystallize the suggestions, objections or assents of the organizations to which it was addressed. A large number of clubs and societies have responded favorably to this address.

The Syracuse Camera Club authorizes the publication of the following :

It may be well in this call for a meeting to effect the preliminary organization which this numerous favorable response authorizes, to herein enumerate some of the purposes that fall naturally within the scope of such a convention suggested in the many answers to the circular.

First.—The stimulus to study, invention, theoretical and technical knowledge that results from personal touch with those devoted to the many sided science called photography, and to dignify a beautiful art that is in danger of being belittled by its aimless practice.

Second.—That those objects are best served by an annual conference preserving its organization from year to year, and governed by a Council or Executive Board and its officers elected annually, or otherwise, as may be determined at the preliminary meeting.

Third.—In connection therewith annual exhibitions of photographs, photographic appliances and apparatus, and thus secure excellence of work and inventive activity.

Fourth.—To promote the application of photography to the sciences, arts and professions, among which we may mention astronomy, mineralogy, geology, botany, biology, medicine, pathology, microscopy, surveying and mechanical engineering, geographical and historical photography, medico-legal photography, submarine and spectroscopic photography.

Fifth.—To preserve the scientific papers and inventions presented at the meetings in an annual volume of transactions, and thereby encourage men to prepare papers upon chemical, optical and other collateral sciences embraced in the field of photography.

Sixth.—To secure arrangements with foreign custom-houses, through the general government, for the safe transmission of undeveloped plates and apparatus belonging to members of the national organization, and to arrange with national, state and local authorities the privilege to photograph in public parks, buildings, and on public occasions, under protection of his badge or membership card.

Seventh.—To secure conveniently arranged dark rooms in all the hotels throughout the country, and special rates for the members of the League and a preservation of a photographic directory of each locality, relating to the objects of historical and scenic interest, and the best time of day to photograph.

Eighth.—To secure from the general government the free interchange of negatives and slides between the various club societies and members represented in the National League or Conference, and foreign photographers or societies.

This is only a partial enumeration of the important subjects that await the action of such an annual conference, and to establish which your co-operation is earnestly solicited. The Board of Directors of the Society of Amateur Photographers of New York, at a meeting held on the 23d of September, kindly granted the request of the Syracuse Camera Club for the use of the society rooms for a meeting of delegates to perfect the preliminary organization.

You are therefore invited to send one or more delegates from your organization, to meet at the rooms of the Society, in New York City, No. 113 West 38th street, on the 4th day of December, 1890, at 10.30 A.M. An answer, as early as convenient, is requested, together with the names of the members who may be delegated to attend.

(Signed,)

WILLIAM DICKSON,
Secretary.

Secretary's address, Box 173, Syracuse, N. Y.

LET HIM WHO MERITS BEAR THE PALM.

To the Editors of Anthony's BULLETIN:

On page 11 of "Wall's Dictionary of Photography" appears, without acknowledgment, a "Table of View-Angles."

Among the tables appended to the "International Annual" also appears a "Table of View-Angles," credited to me.

The two tables are identical in language, form of arrangement, style of figuring and application. I do not wish to be accused of "sailing under false colors," and in order to settle any possible questions as to the real authorship of the table in question, allow me to state that my table first appeared in the *Photographic Times* (p. 52, January 30th) of 1885, and in the "International Annual" of 1888. "Wall's Dictionary of Photography" was published in 1889.

Verbum sat sapienti.

CLARENCE E. WOODMAN, Ph.D.

OUR ILLUSTRATION.

THE frontispiece of this issue of the BULLETIN gives a couple of those characteristic scenes that are found only in great cities. The peculiar phases of life that are seen along our crowded streets serve as excellent motives for the amateur and his hand camera, and if only reasonable care is taken in the matter, these scenes form a source of pleasure both to the one who captures them and also to those who see them afterwards, either as lantern slides or in the album as silver prints. Many a little bit of life is caught in this way that brings either smiles or tears to those who see it flashed before them in the photograph.

A WARM WELCOME HOME FOR MR. JOHN CARBUTT.

On his return from Europe recently, Mr. Carbutt, the well-known dry plate manufacturer, received a welcome from his employees that must have made his heart feel warm. In his office was a large floral piece in the form of a keystone, and on the latter the initials "J. C." and "The Heartfelt Wish of the Work-people—Welcome Home!" The letters were in red, white and blue flowers, and the whole piece stood about 4 feet high upon a bed of roses.

Mr. Carbutt thanked them for this evidence of their kindly feelings, and said he was happy to be with them again. And as a further evidence of his appreciation of their friendliness, each employee, on the following Saturday, received, in addition to his usual week's salary, an extra week's salary, and in the envelope the following lines:

"Desiring to recognize faithful service during my absence in Europe, I hereby present you with a week's salary and my best wishes. Also accept my sincere thanks for the beautiful floral 'Welcome.'"

Such cordial relations between employer and employee will insure the success of any enterprise.

THE DAGUERRE FUND.

SUBSCRIPTIONS ARE STILL IN ORDER.

THE following is a partial list of the contributions to the Daguerre monument as far as we have received notice of them up to this date. We shall take pleasure in adding to this list as the names are sent to us. These are in addition to the money raised by dollar subscriptions:

Dr. A. H. Elliott, \$25; G. Cramer, \$500; E. & H. T. Anthony & Co., \$500; W. V. Ranger, \$10; W. G. Entrekin, \$100; C. H. Codman & Co., \$100; Benjamin French & Co., \$100; G. Gennert, \$50; Rhinehart (City of Denver), \$50; Sheen & Simpkinson, \$25; D. P. Thompson, \$25; L. W. Seavey, \$25; Hetherington & Coover, \$25; *St. Louis and Canadian Photographer*, \$25; S. J. Dixon, \$25; G. D. Milburn, \$25; Brodie Mfg. Co., \$25; John W. Morrison, \$25; D. R. Coover, \$25; Fowler & Slater, \$25; Catherine Weed Barnes, \$20; S. L. Stein, \$20; L. C. Overpeck, \$10; L. J. Ullman, \$10; Mr. A. J. Riddle, \$10; *Photographic Herald*, \$10; Ph. Bonte, \$10; J. R. Pearson, \$10; Baker's Art Gallery, \$10; F. E. Hastings, \$10; Buffalo Argentic Paper Co., \$10; J. G. Edgeworth, \$10; E. M. Estabrooke, \$10; Loney & Gable, \$10; E. J. Pullman, \$10; G. H. Van Norman, \$5; W. Stuber, \$5; E. Stanton, \$5; J. M. Brainerd, \$5; E. Fieger, \$5; A. W. Judd, \$5; Eddy Bros., \$3; G. L. Hurd, \$2; T. M. Mackey, \$1; J. R. Clemons, \$1; Bausch & Lomb Optical Co., \$20; J. M. Appleton, \$25; M. A. Seed Dry Co., \$100; R. H. Moran, \$25; Geo. Murphy, \$20; F. W. Guerin, \$10; Arthur, \$10; C. Gentile, \$10; C. W. Motes, \$10; Benjamin Brothers, \$5; Elrobora, \$5; E. Decker, \$5; S. B. Brown, \$5; Eugene Smith, \$5; F. Plotser & Co., \$5; M. G. O., \$2; Geo. Sperry, \$2; Adam Heinberger, \$2; Charles E. Craven, \$2; J. E. Smith, \$2; J. C. Fitzgerald, \$2; W. E. Eusten, \$2; W. Noel, \$1; L. M. Jackson, \$1; S. F. Sloan, \$1; A. M. Wiggins, \$1; J. W. Vance, \$1; A. M. Collins Mfg. Co., \$100; John Carbutt, \$100; M. Carey Lea, \$10.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,

Aided by ARTHUR H. ELLIOTT, Ph.D., F.O.S.
and a corps of practical assistants.

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Advertisements should reach us not later than the
Saturday preceding the issue for which they are in-
tended, otherwise we cannot promise to publish them
in the succeeding number. It is also necessary to notify
us of any alteration before the date above mentioned,
and to state for what period the advertisement should
be continued—whether for one, six, twelve or twenty-
four issues.

E. & H. T. ANTHONY & CO., Publishers.**POSTAL PHOTOGRAPHIC CLUB.**

THE October "Album," circulating among
the thirty members, on its journey from Vir-
ginia to Massachusetts, exhibits seventy-four
prints. The September "Album" contained
over ninety. In both issues nearly one-third
the prints are by the beautiful platinotype pro-
cesses.

In the October volume, Miss E. T. Needle's
fine platinum enlargement of "The Bridge of
Sighs, contends in votes with Mr. Hausman's
artistic cloud effects on the Potomac, entitled
"Washington Monument." Among other
good pictures are Mr. Briggs' and Miss Eddy's
character studies in darkey child life; and
Professor Spaulding's (the Club's President)
hand camera snatches on Irish and Scottish
lakes.

**PHOTOGRAPHERS' ASSOCIATION OF
AMERICA.**

EVENING SESSION, AUGUST 14TH, 1890.

(Continued.)

Mr. J. R. CLEMONS, on being called upon,
then addressed the Convention. Mr. President,
Ladies and Gentlemen: It has been some time
since I have been called upon to appear be-
fore an intelligent audience like this. Of
course, you all think I know something of

printing. But it sometimes seems to me that
I do not know anything. Of course, you all
run into obstacles, and so do I. All paper is
workable, no matter how old. I have paper
on hand I have had for years. Of course, I
am a comparatively young man—sixty-nine.
Well, of course, I am not manufacturing
paper now. But the first thing to note is the
eggs. Some people in Europe rot the egg to
get the results. I am now making a paper
for my own use. It is a paper prepared with
acetic acid; it also prints red, and to make it
redder, I also use lots of nitric acid in the
bath. Of course, these prints are brown, but I
can tone them just where I want them. When
I come to tone them, I first thoroughly wash
the prints. All the free nitro-silver must be
washed off as far as possible. If your print is
yellow, I can see your print has not been
thoroughly washed. But after you wash the
prints, and before toning, I put the prints into
water which has some bicarbonate of soda,
and leave them a while. After toning up to
the point, I then put them in water strongly
impregnated with table salt. If you take the
print and do not wash it, and put it right into
the acid, you get a yellow print. It forms a
compound which you cannot remove easily.
Blisters, of course, will come up in certain
papers. You must be careful with a new
brand of paper. I try to know the brand of
paper. I keep trying and working the best.
I have worked a great many prints of paper,
and I think it is the best known. It is a long
heating paper. Well, I have got that far,
but I did not commence where I ought to
have done.

I use a middling strong bath now. No
paper is workable silvered. It is tempered
through the albumen. When you come to
tone it, the albumen not being coagulated,
you will find it rubbing off on your fingers.
A great many are bothered with the albumen
while toning. I am not favorable to double
albumen paper. The old prints are in some
respects better than the modern prints.
When you are doing much work you do not
want a particle of albumen paper; you want
a good strong brown that you can put under
glass. You can see several specimens of such
here. In the silvering of this paper there
are two of us who use the same dark room.
The other fellow is contrary, and so am I.
Always when I silver a sheet of paper I have
the pole 8 feet long and 2 inches in diameter;
in silvering the paper I have four poles and
silver three-quarters of a ream in two times
and work about one-half the day. When I
get the fourth silvered, the first is ready to

come off. If you take the silver paper and hold it up, one end will print better than the other end if you do not hold it up right.

A Member—How strong do you have the bath?

Mr. CLEMONS—I usually use 40 to 45. I silver sometimes three and one-half to five minutes, if it is heavy albumen. You are sure to know when the paper is thoroughly silvered.

A Member—After having silvered eight or ten sheets of paper, do you strengthen the bath?

Mr. CLEMONS—I took seventy-two sheets of paper and folded seventy-two sheets with that, and then I found that the amount of silver each sheet took up was $26\frac{1}{2}$ grains. These remarks apply to all heavy albumen paper. The strength of the bath must be according to how long you silver. Sometimes your paper will blister, as soon as you put it into the hypo; the cure for that is table salt put in. Sometimes there is a blister under all conditions. Alum is a good thing, but salt is better, and surer in its results, if alum fails.

Mr. MILBURN then read an interesting paper.

Ladies and Gentlemen: A substitute for glass for negatives being of universal interest to all, I wish to say a few words of the progress the Eastman Company have made with their transparent films during the past year.

For the edification of those present who are not acquainted with the subject, I wish to say that the films in question are thin, flexible celluloid sensitive films, and take the place of glass dry plates, so that they can be spooled on a roll and carried right in the camera as a magazine and used at the pleasure of the operator, doing away with both bulk and weight of the glass dry plate.

Last year at this time the only evidence the Eastman Company could show for their claim of having invented and perfected these thin films in continuous lengths was a few samples, but now they actually have the goods on the market, and the orders for the films are so great, that although they have a large plant for the express purpose of manufacturing them, still they cannot fill but comparatively a very small percentage of their orders, making some skeptical people say that they believe the Eastman Company has been forced to discontinue manufacturing the films. The facts are that the Eastman Company are working night and day on these films, and are producing from 600 to 800 linear feet of transparent films, 41 inches wide, per day, one-third of this product going to Europe.

Our claim of invention has been disputed by some of our contemporaries, but we are happy to state that the United States Courts have seen fit to sustain our claim to the extent of granting us Letters Patent, and also of setting aside an injunction brought against us by the Celluloid Company of New Jersey, one of the largest concerns in the world. The Eastman Company do not claim that they are the inventors of celluloid, nor the first to coat it with a sensitive emulsion, but their claim of invention is a flexible substitute for glass for negatives in continuous lengths. I here want to call your attention to a spool of the films, to its thin, even, smooth appearance and uniformity of surface. The great desideratum in a film of this kind is flexibility, and that you will find here. At the same time, the base is perfectly transparent, and is impervious to the chemicals in the developer. Among the many difficulties encountered at the commencement of the manufacture of these films, and which has caused much conjecture as to its origin, is what we term electric spark impression, caused by an electric spark imprinting itself on the sensitive surface during the process of manufacture. This evil has entirely been gotten rid of, and now there seems to be only one trouble, and that is to manufacture them in quantities sufficient to meet the demand. We believe that it is only a matter of time when you all will use these films for outdoor photography.

I wish to call your attention to our little kodak souvenir, as the negatives are made on the Eastman Company's transparent films, and I think you will all agree with me that these pictures are clear and brilliant as those made on dry plate.

It was moved and seconded to adjourn. (Carried.)

The Convention then adjourned until Friday A.M., at 10 o'clock.

MORNING, AUGUST 15, 1890.

EIGHTH SESSION.

The President called the Convention to order at 10.45.

There being no communications reports of Committees were asked for.

C. W. DAVIS—The Committee of Ten appointed to confer with me upon the subject of prices, reports that it is not advisable to do anything at this time.

No unfinished business.

The President called for new business.

L. J. ULLMAN—Mr. President: I move that the thanks of this Convention be tendered to Mr. J. M. Appleton, Mr. W. G. Ranger, Mr.

George H. Hastings and G. M. Carlisle, Executive Committee, who have conducted the affairs of this Association so ably.

(Seconded and carried.)

C. W. DAVIS—I move the thanks of this Association be extended to the Press of Washington City for their able and accurate reports given of our proceedings.

(Seconded and carried.)

Mr. MILBURN—I wish to speak for the manufacturers, and to extend thanks for the business-like methods pursued by the Convention, particularly by the Secretary.

(Seconded and carried.)

Mr. RANGER—I wish to offer the motion to extend thanks to this institution and its officers for their kind attention and many courtesies shown us during this meeting.

(Seconded and carried.)

GEORGE H. HASTINGS—I move the appropriation of \$1,000 for the awards, which includes also the badges of the Association for the next year.

(Seconded and carried.)

GEORGE H. HASTINGS—We are on the basis of economy. Every year that medals are made the expense of the die is fully \$250. I want to make a suggestion: We can offer a prize for designs for a permanent medal to use all the time. For a prize of \$25 or \$50 offered for a design to be submitted to the Executive Committee in January, which this committee could select, there would be saved from \$250 to \$300.

I move a prize of \$25 be offered for a medal which shall be a permanent medal until otherwise ordered.

(Seconded.)

Mr. BIGELOW—In relation to offering a certain sum for designs, I think that this matter could be conducted as any other business and save money for our treasury. I think you will get plenty of designs for paying for them.

G. H. HASTINGS—If we have our own design we can go where we wish and have our work done. I should feel that the prize would be a better way to settle that matter.

(After some discussion Mr. Cramer moved that the whole matter be referred to the Executive Committee, which was seconded and carried.)

Mr. MURPHY—I make a motion that a list of all the subscribers who subscribed yesterday to the Daguerre Memorial be sent to the dealers of the country, so that they may know what has been done.

(Seconded and carried.)

Mr. Ranger wished the deficiency added to the report.

It was suggested by Mr. Ullman that some gentlemen were present to-day not here yesterday when the subscription was taken, and they ought to have the opportunity to give their portion.

The President—We are ready for announcements of contributions at any time.

Dr. Elliott stated that he collected about \$100 yesterday and turned it over to Mr. McMichael, and that he (Elliott) has now on hand about \$30. And that Mr. Pullman of Washington had offered to make cabinet pictures of the Daguerre Memorial when unveiled, and that every subscriber of \$1 should receive one.

Mr. GENTILE—I move that after all means are exhausted of obtaining funds, then this Association make up the deficit.

(Seconded.)

E. LONG—I object to this motion; I believe it will kill the subscriptions at once, for all the responsibility will be thrown on the Association. I wanted to claim, as one of the first members of this Association, the privilege of giving the first dollar. I succeeded in giving the second. I will add to that another \$5.

(To be continued.)

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—W. A. writes: Will you favor me with the following information through the BULLETIN and oblige? 1. Why is water sometimes ordered to be put into acids in dissolving chemicals—does it increase the energy of the acid? 2. Why does an explosion often result by pouring water on to sulphuric acid? 3. Is an explosion likely to occur by any other means in working with sulphuric acid?

A.—Water is sometimes added to acids to facilitate solution, because the salt formed is insoluble in strong acid. For example, iron is insoluble in concentrated sulphuric acid, because the iron sulphate that is formed at once upon the surface of the metal is insoluble in the concentrated acid; but on the addition of water the metal dissolves readily. An ex-

plosion does not result upon adding water to sulphuric acid, but the heat generated on mixing the two fluids is often so great as to appear explosive in the manner in which the steam comes off. An explosive outburst, such as you mention, is not likely to occur if the acid is poured into the water and *not* the reverse.

Q.—E. C. writes: Will you kindly give me the formula for making *blue* transparencies? I have tried several times and have always failed. I now intend to use exposed plates which have been discarded but not developed, as I was told by a stock dealer that he made them in that way. Please give me the formula for coating the plate. I intend to first clear the plate, before coating, in hypo and wash thoroughly.

A.—A very good method of making blue transparencies is given in the last volume of the "International Annual" of Anthony's Photographic BULLETIN, 1890, by Robert Bencke. The details are too long for these columns.

Q.—I do not quite understand what you mean in regard to the silver deposited in the fixing bath (which you mention on page 612 of last BULLETIN). Will you please state in the columns of next issue whether or not you mean that 1,230 cabinet plates only contain 184 grains of silver?

A.—The statement given was taken from a German journal, and we cannot now find the reference. There is probably a mistake in the translation, and it should read 184 grams.

Q.—D. H. H. writes: Some eikonogen crystals I have had on hand for six months have turned to a dark color and now in color resemble iodine crystals. Would you please

answer in the BULLETIN what is the nature of the change? And does such change impair the developing quality of the eikonogen?

A.—See the article in the last number of the BULLETIN, page 618. Also observe note at the end of article. Also see discussion, page 631.

Views Caught with the Drop Shutter.

MR. ABRAHAM BOGARDUS has prepared three lectures on photographic topics, entitled: "Forty Years Behind the Camera;" "The Sun a Limner, Historical;" "Lights and Shadows as Seen Behind a Camera." These lectures are instructive as well as entertaining and amusing, and any one wishing to secure Mr. Bogardus for an evening's entertainment should address him at 486 Quincy street, Brooklyn, N. Y. Mr. Bogardus's reputation as a humorist, and his entertaining manner of speech should secure him all the work upon the lecture platform that he can take care of.

W. D. GATCHER, at Louisville, Kentucky, and A. D. Gatchel, of Birmingham, Alabama, send us a fine quarto catalogue of October, 1890, containing 150 quarto pages, printed in excellent style and well illustrated. All those who need photographic goods in the sections where these gentlemen do business will find every requisite for their needs.

H. A. HYATT, of St. Louis, issues Catalogue No. 12, containing 276 quarto pages. The Mound City Stock House is too well known to need commendation from us.

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THE LAST LOAD



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MUSHROOM GATHERERS



Empire Photo Service, Inc. N.Y.

COME ACROSS

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D., *Editor.*
ARTHUR H. ELLIOTT, Ph.D., F.C.S., *Associate Editor.*

NOVEMBER 22, 1890.

Vol. XXI.—No. 22.

THE PHOTOMECHANICAL EXHIBITION IN NEW YORK.

THE New York Camera Club have inaugurated a new kind of photographic exhibition ; at least it is new to this country as far as we know, although similar exhibitions have taken place in Europe. This new departure is a display of photomechanical prints, and the enthusiasm which it has called forth among photographers, artists and the publishers of illustrated books and periodicals, leads us to believe that it is only the beginning of a series of annual displays that shall serve for the exhibition of progress in applied photography.

Beginning on the evening of November 3d, and ending on the 15th, the rooms of the New York Camera Club had a constant stream of visitors in answer to the cards of invitation sent out by the members of the Club to those interested in photomechanical printing. The committee who had charge of the affair were: Messrs. Lindsay C. Ivory, Chairman ; E. N. Dickerson, Jr., Dr. Arthur H. Elliott, W. A. Fraser, Franklin Harper, W. Herbert, Horatio O. Ladd, W. L. Pierce, Dr. Henry G. Piffard, Linzee Prescott, Geo. P. Rowell, J. Egmont Schermerhorn, Franklin W. Stillman and Dexter H. Walker. And, although his name does not appear upon the committee, one of the most active and enthusiastic workers for the success of the exhibition has been Mr. David Williams, the President of the Club. Each day of the exhibition some members of the committee have been present in the rooms to explain to visitors interested in the processes any points that attracted their attention.

Another unique feature of the exhibition was the fact that no prizes were given, no diplomas and no opinions as to the merits of the work on display. Each of the firms that sent pictures was assigned a wall space, and the pictures were hung, as far as practicable, according to diagrams furnished by them. To make the exhibition still more interesting, Professor Charles F. Chandler, of Columbia College, wrote a very clear essay on photomechanical processes that embraced not only the methods, examples of which appeared on the walls, but also others that were interesting historically or otherwise. The exhibitors also gave short descriptions of the applications of the methods to various classes of work, which were also printed together with Professor Chandler's essay, forming a valuable souvenir of the exhibition.

We cannot spare space enough to do justice to the many beautiful examples of photomechanical printing which hung on the walls of the Camera Club ; and to those of our readers who could not attend the exhibition we would say, that an effort is being made to have the entire display exhibited in other cities. For the sake of those who admire this application of photographic art, we sincerely hope that the firms interested will consent to this arrangement.

To give a faint idea of the character of the exhibition we will mention a few of the pictures in the several collections. We would also note that these were sometimes exhibited in albums upon the Club's tables as well as on the walls.

The Photo-etching Company had five large frames, about 2 x 3 feet each, showing reproductions of oil paintings. All were of the finest specimens of this class of work. Two of them deserve more than a passing word. The reproduction of the oil painting "Venice," by Thomas Moran, was very beautifully done, full of the softness of the southern atmosphere and all the exquisite mellowness of light and shade that is characteristic of the finest artistic execution. It was so well done that some one said it was "all Moran and something more." The other picture was a harvest scene from a painting by L. Lhermitte. This was particularly soft and full of beauty, both from the faithfulness of the reproduction, and also from the lifelike character of the subject: a harvest laborer and his wife resting behind the shadow of a wheatstack, the young mother with a child on her bosom, and with all the sweetness that such a scene embodies.

H. C. Brown exhibited a number of small photoengravings from pen and ink sketches. One of these was quite large, about 15 x 24, representing scenes of summer rambles upon mountain and river; and the rest small heads, views, etc. All was good, clean and sharp work, and well done by the method employed.

Goupil & Company (Boussad Valadon & Cie.) had a number of examples of photogravures such as are used in the *Figaro Illustré*. These were in black, and a number of tints, giving effects of the most brilliant character and well adapted to the illustration of editions *de luxe* of poems and short stories that are much in vogue to-day. In addition to these the same firm showed a number of handsome reproductions of paintings by the same process, many of them printed in colors. As examples of these we may mention Luke Fildes' "The Al Fresco Toilet," from the original oil, which was very finely done. Also, "The Golden Age," after C. Chaplin, a gem of womanly beauty, with all the lovely tints beautifully reproduced.

The Moss Engraving Company exhibited work by their modification of the grain plate, or half-tone, process. Among these was a fine clear head of Salvini, full of vigor and character. There were also a number of small examples of their work, portraits, views, sketches, etc., all of the finest character and carefully reproduced.

The Albertype Company exhibited a handsome frame of their photogelatine work. In this a lovely plate was "Decorative American Wild Flowers," a particularly fine piece of reproduction. In the portraits we noted a fine example in the head of President McCosh, of Princeton. Other portraits and also architectural subjects were very good.

F. Gutekunst also had photogelatine prints. These consisted of excellent portraits, views, yachts, etc. Two particularly fine examples were panels of fish. Among the views was one in Northern Italy, that was exquisite in the fineness of the detail reproduced.

The Electro-light Engraving Company showed some examples of zinc-etching. These were of the highest grade in this method, and consisted of half-tone and line work. Some of the views were tinted, giving very charming effects.

The Photo-electrotype Company had an exhibit of electrotypes, mostly from grain plates. This work was very good, sharp and clean, and exceedingly well executed.

The New York Engraving and Printing Company had half-tone photo-engravings reproduced from photographs and wash drawings. The portraits and wash drawings were particularly well done ; also the views from photographs.

W. Kurtz, who uses a fine modification of the Meisenbach process, had some of the best half-tone reproductions in the exhibition. "Hunting the Polar Bear," by Smith, printed in two colors, was an uncommonly fine piece of work. Another, the "U. S. Mail Coach in the Rockies," from the painting by Remington—a work that it is hard to realize was not the original. A number of the pictures were in two colors, and every piece of work was an example of skill and care in photomechanical printing.

The Heliocaustic Art Company showed a very decided novelty in photo-etchings upon glass. These appear to be etched with hydrofluoric acid through a photographic resist, and are admirably done. Both the portraits and views are soft and full of detail.

The J. Dewing Publishing Company had a large exhibit of photogravures on satin reproduced from oil paintings, and of the most exquisitely delicate character. They also had similar work on Japan paper, reproduced from wash drawings. A number of views in California were very beautifully done.

The Heliochrome Printing Company showed a handsome frame of photogelatine prints which they call "heliocromes." These consisted of tinted reproductions, principally of architectural subjects; but the work was of the highest grade in this line.

Artotypes by E. Bierstadt were another series of photogelatine prints. The examples shown were reproductions of old documents, drawings, paintings and engravings. In this exhibit were examples of the new method of color-printing recently perfected by Mr. Bierstadt, showing a facsimile of the old Dutch interior by Tenier, "The Musicians," and also some handsome pictures in colors of Haviland vases. This work must be seen to be appreciated ; it is extremely beautiful. In the plain reproductions in monochrome there is certainly no better work done than was found in this exhibit.

The Electro-tint Engraving Company had examples of half-tone plate work of high value, consisting of views and industrial subjects, together with portraits. It was well up to the standard of excellence in this line.

The New York Photogravure Company showed examples of photogelatine and photogravure work. It was all well done and full of the skillful adaptation of photographic methods. Among the pictures we noted a profile head of "Mignon," from a pastel by J. Wells Champney, reproduced in photogravure, and very finely done. Also, "A Marriage of Love," a series of pictures from drawings by W. DeMeza ; and wash drawings by George Wharton Edwards, illustrating "Arcadia" by Sir Philip Sidney.

Bartholomew and Peckham exhibited some beautiful work on half-tone plates, ranking among the best efforts in this direction. Some of these were from photographs and a number were from wash drawings, all beautifully reproduced. The tinted examples were finely executed and showed some charming effects.

There is yet another interesting exhibit that we must not forget, a couple of "photo-chromes," kindly loaned by Dr. Delevan, and brought by him from Zurich. They appear to be tinted bromide prints, and look like water-colors of the better order ; the method of production is unknown yet.

Altogether the exhibition was a revelation to those who know little about this kind of applied photography ; and to those interested in the work it gave an opportunity to study and compare methods never before presented in New York City. We hope that this is but the precursor to many similar exhibitions.

EDITORIAL NOTES.

OUR good friend, Mr. William H. Rau, of Philadelphia, has lately produced a photograph of great interest and of much merit, the subject being the Battle-field of Gettysburg, which he has treated in a panoramic way, but which is made all on one negative and printed in one piece, notwithstanding that the view is 18 x 48 inches in size, and takes in an angle of from 165 to 170 degrees. The principle followed by Mr. Rau was the same as that embodied in Moissard's camera, which has been successfully used in smaller work, and which consists in making the lens perform a partial circuit in front of the sensitive film, which must, of course, be curved in such a manner as to be in focus equally in all parts as they may come successively under the light rays entering the camera through it. An ingenious system of diaphragm is worked in conjunction with the clock movement in order to expose only a very small portion of the film at one time, and the entire mechanism is so perfect that a series of double or triple exposures might be made of any portion of the film without so much as doubling a line. The lens used with this camera was a very long focus instrument, the great advantage of which, over short-focus wide-angle lenses is quickly apparent, from the fact there is visible, no distortion of objects, as would naturally have been the case had a lens of this description been used. The enormous saving, too, of time and material in being able to print such a plate from one single negative is incalculable, as compared with the old method of printing from several negatives and mounting the prints together. We are informed that the sensitive films used on this occasion, and which, by the way, had to be specially made for the purpose, were manufactured and furnished by Mr. John Carbutt, of Philadelphia.

WE learn, through a most interesting account by Professor Holden, of the work done at the Lick Observatory, in the direction of astronomical photography, that the negatives made in this field will easily bear the extraordinary test of enlargement to 570 diameters, and frequently double that number. By the aid of enlargements it has been demonstrated that parallel walls on the surface of the moon, not more than 1,200 yards apart, and whose width at the tops does not exceed 200 yards, are plainly visible. If then all this is possible to us now, how much more may we not look for in the future of photography?

AN indication of growth and good condition generally is to be seen in the fact that the St. Louis Camera Club has made application to the court for an amendment to its charter, by which women are eligible to membership.

WE note that a paper is expected from Miss Catharine Weed Barnes, at the December meeting of the Photographic Section of the Brooklyn Institute, which will, no doubt, be full of interest.

NOT very many specimens of the early results of photography, as secured by the Daguerreotype process, are to be seen at this time, but Mr. George D. Dornin, one of the members of the Pacific Coast Amateur Photographic Association, is so fortunate as to be the possessor of several specimens made by himself in the mining camps of the west forty years ago. Some of our readers may run across them, as we understand that several of the prints are now in the east, forming a portion of one of the exchange lantern slide exhibitions.

WE would acknowledge with thanks the receipt of two handsomely gotten-up books of views of characteristic Chilian subjects, from our enterprising friends, Messrs. Diaz & Spencer, of Santiago. The prints are reproduced from negatives made direct from life in most cases, and are printed by the photo-gelatine process on paper 8 x 11 inches, and bound in heavy tinted paper bearing title and design printed in the same way from a wash-drawing. The work throughout would do credit to any first-class establishment in this country, and is doubly meritorious when it is remembered that it is all the outgrowth of a comparatively new enterprise, established far away from the art centers of the world.

THROUGH the perseverance of Messrs. Richard G. Holaman, Chandos Fulton and E. G. Fisher, a nickel-in-the-slot machine has, it is claimed, been perfected and is now on exhibition at the American Institute fair, by which the sitter, on depositing his nickel, receives a tintype of himself within forty seconds from the start. It is intended to place these machines in many public places, and if the result is as has been claimed for them, they will probably become very popular.

THE last number of the *Lithographic Art Journal* contained an illustration of considerable merit in the print from the negative direct, of a bust of Senefelder, "the father of lithography." These prints were produced by photography, but were printed in one continuous roll on sensitized paper, which went through the several processes necessary for toning and fixing in that condition, and were finally cut up and deposited ready for mounting, the main point of interest being in the fact that the process is so entirely automatic as to dispense with much of the help which would ordinarily be required to turn out so much work in a short time.

MR. G. H. CLARKE, of Kansas City, sends us a number of views made by himself with a P. D. Q. camera, developed with Anthony's hydroquinone and printed on N. P. A. paper. The prints are all of excellent quality and evidence good judgment in timing and lighting, and a very thorough knowledge of the practical parts of development, printing and toning. Mr. Clarke writes that he does all his own work, in all its branches, which is another reason that he may be proud of the results obtained. One view in particular, of a little child in the act of scraping together a pile of chips in front of a new log ranch building, is full of good points, the posing and expression of the child being perfectly natural and free from affectation.

THE Albany Camera Club is another which has outgrown its old quarters, and is actively engaged in searching for a new location where more room and better facilities may be had.

WE are in receipt of a characteristic letter from Mr. Romyn Hitchcock, full of interest, in which he refers to the recent accident to Professor Burton, and speaks of the fact that his injuries, though serious, were much intensified by poisoning from iodoform. He further states that Professor Burton is now nearly recovered, and is resuming his duties in the University. We are very glad to state, too, that Mr. Hitchcock has been appointed Commissioner to China for the World's Columbian Exposition, which position he will fill with credit to himself and satisfaction to all interested.

THE Photographic Society of Stevens Institute have just elected the following gentlemen for officers during the coming year: President, Choteau E. Pearce, '91; Secretary, A. E. Merkel, '93; Treasurer, J. V. MacDonald, '93. An exhibition of slides has been arranged for the winter.

It is with much pleasure that we record the fact, that at a recent meeting of the Photographic Society of India, it was proposed to confer upon Professor W. K. Burton, of Japan, the honorary membership of the Society, for his distinguished services to photography. Such a mark of esteem cannot but be a gratification to the recipient, and few are more honestly entitled to it than is Professor Burton.

THE Buffalo Camera Club have started in their winter's work by the election of the following officers for the coming year: President, Dr. M. D. Mann; Vice-President, George R. Howard; Treasurer, Charles E. Hayes; Corresponding and Recording Secretary, George J. Bailey.

THE formal opening of the new rooms of the Camera Club of Hartford took place on the evening of the 11th November, the occasion being a lecture illustrated by photomicrographs. We were unrepresented, owing to distance, but understand that the affair was eminently successful.

AN IMPROVED DROP-SHUTTER.

BY ROMYN HITCHCOCK.

PERHAPS most readers who have become accustomed to the use of any of the excellent devices for instantaneous and time exposures offered by the various makers will deem it a backward step to return to the simple drop for instantaneous work and to the cap for time exposures. On the other hand, it may be said that, with all their excellencies, very few of the fine and expensive shutters in the market are available for such extremely short exposures with large lenses as are required for photographing animals in motion and for some other purposes. I am by no means prepared to assert that for such purposes the drop shutter is better than some other special devices, but it certainly can be made to operate as quickly as any of them by the use of rubber bands to accelerate the movement. For other purposes requiring less speed, the drop is fully equal in efficiency to any other form of shutter up to the point where hand exposures can be made.

But it will be objected that there is no means of quickly changing or adjusting the speed as with the later devices, and that the constancy of rubber bands cannot be relied upon. This is entirely true, and, it may be added, the bands might be lost or used up, and in some climates they soon lose their elasticity. As for the matter of regulating the speed, this is of very little consequence in practice, for the absolute time of exposure is almost never known, and by the exercise of judgment the proper band can always be chosen.

The considerations which have led me to adopt an improved drop shutter attachment for a lens, which I am now carrying with me for general use in the far east, are the result of considerable experience in traveling with a camera.

First, it may be said that one of my first principles is never to make a rapid shutter exposure when a time exposure is practicable. The reason for this is obvious. By using small diaphragms my pictures are always sharp, and they bear enlargement well. If it is a group of natives I am taking, they can usually be induced to pose long enough for a quick hand exposure, and the resulting picture is sure to be more satisfactory than a snap shot with a shutter; consequently I do not make great use of an instantaneous attachment, although I consider it an essential part of my outfit.

Perhaps the greatest advantage of the drop-shutter for my purpose lies in its portability. My shutter is simply a brass drop, which runs through the lens mount close to the diaphragm. When not required in the lens, it is easily stowed away, ready for immediate use. A small projecting ring at the top has a narrow slit to receive one or more rubber bands. These bands are passed under the lens in the usual manner. So far the shutter is arranged like all others of the kind. The improvements which Messrs. Bausch & Lomb have made at my suggestion are important. First, in order that there may not be any partial secondary exposure caused by the springing back of the shutter, which is likely to occur at times, the releasing catch is arranged to engage the shutter as soon as the exposure is made. Rebound is thus effectually prevented. Second, to prevent access of light through the slit cut for the shutter when the latter is not in use, a narrow brass collar is fitted around the lens tube. This collar slides back and forth against a shoulder just sufficiently to open and close the slits as required. We have thus a lens which can be used for instantaneous work without increase of bulk or weight. The diaphragm shutter is also better than the drop in front of the lens, not only because it is more compact and lighter, but because it admits more light with a much shorter drop, and consequently shorter exposures can be made without undue tension of the bands.

The above was written at sea, and my first practical trial of the new shutter was made one bright day after we had passed through at night one of the most terrific blows that are likely to be experienced by mariners. Fortunately, it was not of long duration, but while it continued it did enough damage, and the scene on deck at daylight was one of confusion. Two of the life-boats blocked the way forward on one side, one of them with the bows crushed in by the wave which lifted it as though struck by an enormous sledge-hammer. Not to dwell upon the experiences of the night, the next day there was a bright sun, a strong head wind, and a tremendous sea running with white-crested waves. These I tried to photograph; but it is no easy matter to hold an 8 x 10 camera on a rolling deck, waiting for a firm wave, and to dodge the spray which flies over the sides. But the shutter operated perfectly well withal.

I am now writing at Yokohama. As I look from my window the beautiful harbor with its fine ocean steamers, men-of-war, junks and sampans, with now and then a trim cutter yacht sailing by, is full of subjects for the camera. Towards evening there will be an endless fleet of fishing junks with their square white sails dotting the water in the distance, slowly making their way in, an ever-recurring scene of which I never weary. A fine yacht with all sails spread is indeed a thing of beauty; but a Japanese junk is far more picturesque, whether in the distance or near by.

I well remember one fine day in this same harbor, when I went out with my

camera in a native boat to where the fishing boats were trolling, and for a time was watched with suspicion by some officers of the Japanese customs service, who finally overhauled us in a steam-launch, and were very much disposed to hold me for examination. The experience of that day sufficed to demonstrate the inefficiency of a most excellent shutter which I then had for the very quick work required to take sharp pictures from a bobbing boat.

I fear this communication is too long already ; but I have one more item I wish to add. This is concerning the too frequent use of the shutter. I was strolling about after breakfast this morning, when I saw a large camera on the street with a Japanese beside it. One of the best-known of the Yokohama Japanese photographers was about to make an exposure on a building and street. He had an English camera, 10 x 12, a Dallmeyer lens, and a shutter in front of the lens. The camera was tilted upward, and the swingback was not adjusted. The sliding front was not used, although it doubtless would have served its purpose without any tilting of the camera. The exposure was made with the drop-shutter, using a large diaphragm as a matter of course.

Now, I have no doubt that a good picture was the result ; but it is not the less certain that a better one would have been made by a hand exposure with a much smaller diaphragm. Moreover, the careless tilting of the camera is sure to have introduced some distortion in the lines of the building, which may not be noticeable, however, in the prints. I cite this as an instance of how work is sometimes done—not as a criticism of the Japanese operator only—for the same want of attention to minor details is to be observed among those who have not the excuse of the Japanese for their omission.

YOKOHAMA, September, 1890.

[From the *British Journal of Photography*.]

THE ART OF RETOUCHING.

BY REDMOND BARRETT.

CHAPTER VI.—STUDY OF THE FACE.

(Continued.)

THERE are many who, although very fair artists, have never given this subject sufficient serious consideration. To those who intend making portraiture their especial forte, it is of absolute necessity that they should study the face exhaustively. I fear, however, they do not always do so. If you were to ask an ordinary student where the strongest likeness or individuality of any given subject is to be found, he will in all probability be rather puzzled, and unable to decide. This should not be so ; he should be able to form a strong and well-founded opinion at once. Of course the locality of this leading expression or feature may vary considerably in many heads. In one it may be centered in the eyes, or nose, or the formation of the lower part of the face. In many cases, too, it may be in the forehead, although it is not usual to look in that locality for the seat of likeness. Now there is no sound reason against our looking for the leading characteristic of a face on the forehead. On the contrary, if we give this point our most serious attention, I feel sure we will be able to recognize that the forehead possesses in most cases a very strong and marked likeness or individuality stamped upon it. Another point which may never have

struck the student is, that this individuality or leading characteristic, when situated upon the forehead, is not at the command of the possessor to alter or disguise.

It is strange how one may gain sound information on a subject, or have their attention forcibly drawn to it, as will be seen by the incident which first caused me to direct my attention to this oft-neglected portion of the face. Indeed, it was a strange accident which caused my attention to become firmly riveted upon this feature (the forehead), and showed me the advantage to be gained by giving it its proper amount of consideration.

One day, by the merest accident, I was introduced to a very prominent member of the Criminal Investigation Department of Scotland Yard, and after touching upon many subjects, and repeating many anecdotes, the conversation turned upon the power of recognizing people under various conditions and disguises. This, in due course, led to the question as to where the principal seat of likeness was situated, and deciding upon this point we had to take into account the power of the possessor to alter or change it in such a way as might render it more or less unrecognizable. This, as any one may easily guess, led to a pretty long discussion, and during its continuance I was more than surprised at the extraordinary emphasis he laid upon the upper part of the face. The instant he advanced this argument I was bound to confess that he was perfectly right, and ever since have given more than ordinary attention to the retouching the forehead with a view to preserving all its minute details and characteristics.

"Give me a man's photograph," he said, "and let me see his forehead, and I will pick my man out of a thousand!" In this connection he mentioned the name of that archfiend Peace, a man (if we may term such a monster a man) who had the most complete control over the lower half of his face. To such an extent indeed did he prove his power of altering it that he did not hesitate to mix with the very men whose duty and business it was to arrest him. Now, had the officers in charge of this case been endowed with the same thoughtfulness as my friend suggested, there is but slight reason for doubting that he would have been captured the first time. As he said, "When I want a man, and have any doubts, I try to see his forehead; here I find the likeness over which he has no control. No man has the power to change this feature, while all others he can influence to a greater or less extent."

I saw the truth of all this in a moment, although I candidly confess I never before looked for much likeness in this locality. The forehead is a massive shape, and one, too, over which the muscles have no permanent power; it is solid, possessed of delicate formations, which carry with them no small amount of recognizable likeness. My attention once drawn to this point, I am bound to say I have since given this portion of the face more study and thought than I had ever done before. It is because I believe it (from experience) to be so essential that I now place this little experience before the beginner. When we thoroughly realize that every little half tone is a necessity, and must be preserved for the special purpose of securing likeness, we will not start recklessly and smooth the foreheads of our negatives in such a way as to ruthlessly destroy those slight markings, which, if preserved, would so largely tend to make a lifelike and striking likeness. No portrait can be regarded as successful if devoid of these most essential qualities.

For many a "pleasant picture" is all that may be required ; but this idea must not form the basis of our study. We must know the correct treatment first ; we can then modify and pander to all the whims and desires of our misguided customers without having our own powers degraded, or at least corrupted. I am very glad to be able to say that the unbridled flattery which found such universal favor some few years ago is no longer in such demand. To the skillful retoucher much, however, is still allowable, and much is expected from him in the way of artistic effect ; but all these he can accomplish without destroying the individuality of the portrait.

The forehead having been made a special study will, after a little practice, become an easy feature for the accomplished retoucher to exercise his skill upon. We can then proceed lower and treat the other features. Having completed the forehead down to the brows, we come to the eyes. In all portraits the eye should be a dominant feature, full of expression and life. No portrait can be lifelike or resemblant with imperfect eyes, and too much trouble cannot be taken to render them effective and full of expression. This organ, if not altogether overlooked, is too often regarded as a secondary consideration, both by retouchers and photographers ; yet it is one the proper treatment of which demands the greatest care and skill. As our object is to thoroughly master all the various details of the face, so as to arrive at the greatest degree of excellence, special attention must be directed to this organ and its treatment. The eye is a feature greatly effected by time and other natural influences, and it is as well to know where to look for these changes, and how we should treat them when found. This is a knowledge which must be acquired, for it is better far to leave the eye altogether untouched than attempt to treat it without sufficient knowledge as to how we should proceed.

The progress from childhood to youth is indicated in the inner angle of the eye, while as years roll on and manhood advances, on the outer angle will be found the indelible records of advancing time. These we must modify, but in so doing must take great care not to lose any of their character. The difference of expression and character between the eye of a man and that of a woman should not be passed over without sufficient consideration. The eye of the former is benefited by the possession of a look at once epic and philosophical, while that of the latter must be depicted in all softness and brilliancy expressive of tenderness and sentiment.

The eye of a lady should be, as a rule, treated as in full light, so as to demonstrate and clearly bring out all the characteristic delicacy of construction possessed by it. When photographed in such a light as may show every detail of structure, the desire to intensify or accentuate all the visible niceties of form may often lead the student to error, if not to utter discomfiture. In small portraits, even if we succeeded in detailing all the little feathery forms noticeable, it would be absolutely impossible to handle the eyes with such accuracy of relative density as would preserve the lifelike expression so necessary, and would consequently be a useless expenditure of time and trouble. Where the rendition of very minute details is not necessary to resemblance they should be merely indicated ; this is mostly observable in large light and shade portraits, and they require the most scrupulous truth and judgment in their treatment. In all negatives where every minute portion of the structure of the eye is thoroughly depicted, every line must be rendered, but with great care, as should certain

portions be touched in such a manner as would result in spottiness or severity, utter ruin would be the inevitable result. When successful, however, such treatment results in imparting a considerable amount of breadth and natural effect to the picture—qualities well worth securing.

A light sufficiently strong to throw the eye into deep shadow is one that should not be used for photographing persons advanced in years, as it is most unfavorable to the truthful production of likeness. It will not only signalize much too forcibly the indications of age as regards the eye itself, but also the surrounding traces and indications of age will be accentuated to a most unnatural as well as most unpleasant extent. When, however, such a light happens to be used, it will be the retoucher's task to preserve breadth by preventing dark spots appearing upon broad lights and subduing any bright spots of light which may be showing in the dark tints and half tones, or, in other words producing general softness of gradation between the lights and shades. There are cases where success in this direction will be found almost impossible, if not absolutely so, but it should always be conscientiously struggled after.

To convey the impression of vitality and intelligence to the eye, every part of it must be accurately adjusted and cared for. The light reflected in the eye must be many degrees brighter than that of any other portion of the face, having strict regard to the ever necessary preservation of general harmony with the surrounding portions.

The eyebrows in dark-complexioned people should not be treated in such a manner as would make them appear a hard or solid mass; retouching the flesh in a sharp line up to the brow will produce this very undesirable defect.

The cautionary remarks against severity or hardness of lines apply equally to all parts of the face, such effects being altogether false to nature as well as contrary to all feelings that are artistic. The exceptions to this rule are very few indeed, such as in the cases of men with very bushy brows, or here and there tufted, or perhaps a break in the hair; these points must be represented by very spirited and decided touches with a soft and blunt pencil, but no attempt must be made to individualize the hairs, as such would be sure to result in failure both as regards effect and fact.

A striking feature, and one upon which much of the character of the eye depends, is the upper lash; the lower contributes but little to the marking of the eye. The proper definition of the eyelids and eyelashes has considerable influence on the beauty of a portrait. If the former should have moved slightly in exposure we should do our utmost to sharpen them, and so give force to the drawing of the eye and its surrounding. Of course, the fault of this lies with the operator, but he is as many times unable to avoid it, owing to the restlessness or nervousness of his sitter. If the lower lash be without sufficient force to throw up the eye, we should help it a little by accentuating some of the surrounding lights that might create a contrast, and if that does not prove sufficient, a few touches on the print will accomplish our object.

The treatment of the eye may honestly be considered complete when we have thoroughly mastered the working of its surroundings, as in most cases the eye itself is best left alone. Extreme care, however, must be given to retouching that portion of the face under the eye, and situated between the lower eyelash and the cheekbone, because if it be retouched sharp up to the eye it will produce

a harsh, dark line, which is most objectionable. Too much care cannot be bestowed upon this feature when at all touched upon, so better by far leave it alone than, retouching it, fail to do it justice. Having succeeded in treating this feature satisfactorily, we must turn our attention to the rest of the face.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Testing Lenses and Determining Their Accomplishments.—The Berlin Congress of Amateur Photographers.—Gaedicke's New Blitzpulver.—Rapidity of Burning Magnesium Flashes.—Warnerke's Sensitometer.—New Printing Processes with Azo Dyes.

THE testing of the most important and most expensive parts of photographic equipments, the objectives, has been the subject of manifold discussions, sharply illustrating the imperfection of the present methods of examination. Notwithstanding all scientifically confirmed methods, although they are not now generally applied, the so-called empiric test will retain its value. Just as the astronomer proceeds with the reading of a book through the telescope, and then with the dissolving of double stars, to test the resolving power of the telescope, or as the microscopist determines the good properties of his lenses by viewing so-called test-objects, so a photographer is justified in admitting the test upon portraits or landscapes, taken with different diaphragms, as decisive. It should be noted here, of course, that the opinions about the greater or inferior accomplishments of an objective may yet differ to a great extent. Under the definition, "sufficient sharpness to the edges," everybody will comprehend something different; the reproducer desires the "sharpest cut," and another one is satisfied with a medium sharpness. United agreement will never result in this respect. I myself define "sufficient sharpness" by meaning such sharpness that even at six times enlargement will yet admit a distinct recognizing of the outlines under the focusing lens. If that is the case, I know that the negative will stand six times enlargement, and that is by all means acceptable. Till now one has been satisfied with a determination of the chemical focus, the illumination (relative opening) of the picture field and visual field (light circle), and the latter was frequently designated in angles.

I believe that it will best meet the views of scientists and opticians to accept the focus as a base for all sizes, without exception, as is already done for diaphragms. If one says that the serviceable picture field is 54 degrees, a mathematician at the most—if he knows the focus—will have a comprehension of the real picture size. Still, to make sure, he will have to look over the trigonometric tables. Who knows, for instance, how large the plate is which an objective cuts with a serviceable picture field of 60 degrees? Only by calculation we find out that it is 1.15 of the focus. This can be saved if the picture size is given according to the focus. If I say, for instance, that the serviceable picture field is equal to one and a quarter of the focal distance, the size (or better, the length) of the plate which the objective will cover will at once be made clear to the reader without trigonometric tables, which are in the possession of only a very few. The same is true for the visual field (diameter of picture circle). Here it is much better to say: the visual field is one or one and a half of the

focus, instead of mentioning the angle. If one has the diameter of the serviceable round picture surface, the plate size which is worked out is not necessarily to result therefrom. If the circle signifies the serviceable picture surface, the most varied rectangular shapes can be cut out of the same. The diameter of the light circle or of the serviceable picture field forms always the diagonal line of the plates in question. But we have to adhere to the sizes in the market.

The following table shows how large the diameter of the serviceable picture field has to be, if it shall cover the sizes usually in the market :

SIZE OF PLATE.		Necessary Diameter of the Serviceable Picture Field. Centimeters.
Inches.	Centimeter.	
$3\frac{1}{2} \times 4\frac{1}{2}$	9 x 12	15
	12 x 16	20
5×7 5×8	13 x 18	22.2
	13 x 21	24.7
8×10	18 x 24	30
	21 x 26	34
	24 x 30	38

If, therefore, the serviceable picture field is given as 1.2 focus, the focus 19 c.m., the serviceable picture field is $1.2 \times 19 = 22.8$, which proves, according to above table, that the objective will fully cover the size, 13 x 18.

I have communicated this new method of designating the accomplishment of our objectives to the "Verein Zur Forderung der Photographie," and the practical photographers have declared that it can be understood much better than the angle method.

The first German Amateur Congress has lately taken place here. It offered, not only a very interesting exhibition, but also a number of lectures about photographic novelties, exciting interest and giving much information.

I will mention here the most interesting and important.

The first is about Gaedicke's new Blitzpulver.

The old magnesium Blitzpulver had the defect of a strong development of fumes preventing the taking of several views in succession in the same place. A practical pneumatic igniting apparatus for several simultaneously acting light-sources was also wanting. Both have been remedied by Gaedicke's recent experiments. He has produced a magnesium mixture, which for equal light effect contains about half as much substance as the old Blitzpulver, and therefore only half as much fume will develop. For equal light quantities it will develop about the same quantity of fume as the so-called puzt-light, where magnesium powder is blown through a flame. The fumeless Blitzpulver does not ignite at a red-heat, but requires the white-heat of a flame. To ignite it cotton soaked with niter or chlorate of potassium, or a tuft of collodion cotton should be used ; a pinch of ordinary gunpowder may also serve as an igniting medium. Of these three bodies which may be ignited at a red-heat, the ignition will be carried at once to the Blitzpulver, and this, once in flame will then burn with great rapidity and extremely intense light.

The second improvement in the application of the Blitzpulver is the construction of a simple pneumatic ignitor.

The small apparatus consists in an angular lever, in whose longer arm a fork serves to receive cotton. A pneumatic attachment pushes a shorter arm up, and causes the longer arm with the ignited cotton to fall upon a tuft of collodion cotton, previously placed, which is in contact with the Blitzpulver, so that the latter will just cover the cotton a little. If the Blitzpulver should cover the whole of the collodion cotton, the plain cotton would fall into the Blitzpulver, and go out without ignition. In place of the collodion cotton a small quantity of gunpowder may be used and placed in contact with the Blitzpulver.

A third improvement serves for the protection of the objective before the direct illumination by the flash light, and at the same time the complete use of the whole light for the illuminated object. It consists in the construction of a small lantern, folding and open in front, in which the Blitzpulver is consumed. This may be fastened to any tripod; the pneumatic ignition apparatus can also be fitted to it. The whole lantern consists of a card which is not much larger than a sheet of note paper. In front of the lantern is a simple arrangement to suspend a sheet of tissue paper to diffuse the light.

Of the new Blitzpulver about half the quantity is used for one sitting in comparison with the old powder. I believe that there is reason to give renewed attention to the Blitzpulver, since Dr. Eder has proven how much quicker it is consumed compared with the flash light blown through a flame. This burns oftentimes much too slow for instantaneous views.

Eder obtained the following results :

KIND OF FLASH-LIGHT.	DURATION OF CONSUMPTION. SECONDS.
1. Explosive magnesium mixture (30 parts perchlorate of potassium, 30 parts chlorate of potassium, 40 parts magnesium powder, containing $\frac{1}{2}$ grm. magnesium); by means of cotton to be brought to ignition	$\frac{1}{20} - \frac{1}{30}$
2. Pure magnesium powder, blown pretty rapidly through a glass tube into an alcohol flame by means of a rubber tube in the mouth; $\frac{1}{2}$ grm. magnesium	$\frac{1}{8}$
3. Pure magnesium powder, consumed in a Schirm's lamp; $\frac{1}{4}$ grm. magnesium powder blown through the flame by swiftly pressing a pneumatic bulb between both hands	$\frac{1}{7}$
4. Pure magnesium powder consumed in Ritter von Loehr's lamp; the magnesium powder is poured here into a reservoir and blown into the flame by means of a double rubber bulb, and pressing with the hand the foremost bulb at the moment of consumption; $\frac{1}{2}$ grm. magnesium,	$\frac{1}{4}$
5. Pure magnesium powder consumed in a Dr. Hezekiel lamp; the magnesium powder thrown into the glass chimney of a petroleum lamp by a kind of sling; $\frac{1}{4}$ grm. magnesium	$\frac{1}{15}$

Eder says : "These experiments demonstrate that the rapidly burning magnesium, mixed with chlorate of potassium (so-called explosive mixtures), are consumed the quickest (on an average of one-twenty-fifth of a second), and appear, therefore, to be the most suitable, if during the least possible space of time a very strong effect of illumination for photographic pictures taken in artificial light is to be obtained. The explosive mixtures, which in the form mentioned and

treated correctly can be handled without the least danger, are in this direction unsurpassed.

Another interesting communication from the Congress was in regard to the world-renowned Warnerke sensitometer. Dr. Karsten, from Kiel, tells us the following about it :

“The sensitometer of Warnerke has been repeatedly—particularly lately—the subject of discussion and investigation, and to point only to the Transactions of the Paris Congress and the different notices in the *Photographische Mittheilungen*, they are decidedly adverse to the instrument. A thorough investigation of the sensitometer had to extend in two directions. One upon the phosphorescent plate, which was added to the apparatus as a normal light source, and the other was the color table and its gradations. The examination of the phosphorescent plate was to determine :

First.—The decrease of illumination after exposure.

Second.—How the absolute brightness depends upon the kind of illumination.

Third.—The influence exercised by temperature, also the color by application of different color-sensitive plates. The first of these points has been investigated by Professor L. Weber jointly with the writer. The medium value of twelve test-numbers shows that the brightness decreases in the critical half minute during which the exposure of the dry-plate is to take place, from 100 to 65. Warnerke's assertion that “à partir d'une minute après cette action, l'émission se maintient assez longtemps dans un état constant,” is therewith contradicted, if the definition of “assez” is not to be taken short. We have also experiments by L. Weber about the color table (scale). He proved that the transparency of the several fields was by no means in the proportion given by Warnerke. It was surprising that the fields 19–16 showed very little gradation in the transparency, and then there was a sudden jump. This result is, of course, only for the present sample of sensitometer. If the investigation has not been terminated, one can recognize already so much, that the Warnerke sensitometer shows many defects, and that it is very desirable to replace it at last by an instrument based upon a more correct physical formation.

Particular interest is excited by the lecture of Dr. Witt on the new printing processes of Messrs. Cross, Green and Feer for positives upon an entirely new basis, and which have already engaged the attention of scientists at their meetings in September.

The speaker reports that the above processes are based upon the application of the so-called azo bodies, which are coloring matters, with only the green unrepresented. The great number of these coloring matters is remarkable, of which about 2,000 can be produced. These coloring matters now offer the prospect of producing photographs in every shade. The older one is Feer's process by Dr. Adolf Feer of Lorrach, the other the primuline process of Green and Cross in Bern, which was published in June of this year. The primuline process is restricted to only a few azo bodies, while the Feer process can be extended to all azo-coloring matters. The theory of the primuline process has already been described. It has a great future as a Lichtpaus process. The exact contrary of this process is Feer's. While the primuline process is based upon the theory that the organic compounds not touched by light, and which have therefore remained undecomposed, are changed into a coloring-matter by a subsequent treatment, the formation of the coloring matter having been prevented at

the exposed parts, in the Feer process a coloring-matter is produced directly by light at these places ; so that by this process, leaning towards the ordinary copying process, a positive paper picture can be obtained from a photographic negative (see patent description, February, 1887), with every diazo compound capable of forming a sulpho acid, if brought together with sulphite soda into aqueous solution. If paper is impregnated with this by adding at the same time an amine or phenol, and the dried papers are exposed to light, the sulpho acids will return to their original compounds—free simple diazo compounds and sulphite of soda. The free diazo compounds form now with the amine or phenol present the desired azo color. These pictures now possess one defect. They are more on the inside of the paper than upon the surface, the solution applied having to be alkaline. Alkali attacks the size of the paper and thus allows the penetrating of the liquid. With regard to the fastness of the produced coloring matters, the speaker remarks, that they can be designated as fast, and he adds, that on account of the prejudice against the first anilin coloring matters, the public is doubtful about the fastness of artificial organic coloring matters.

BERLIN, October, 1890.

[From Photography.]

SENSITIZING CANVAS FOR ENLARGEMENTS.

THE simplest method of making enlargements on canvas is by collodion transfers, but the following will be found a good method of sensitizing canvas : The canvas must be first carefully washed with dilute ammonia and water, to remove greasiness, and then with a little distilled water. Brush over it the following solution :

Gelatine	100 grains.
Potassium bromide.....	200 “
Water	10 ounces.

When dried, float on a 30-grain solution of silver nitrate ; expose when fairly dry, and develop with—

Pyrogallie acid.....	2 grains.
Citric acid.....	1 grain.
Water.....	1 ounce.

Fix in hypo.

Coating the canvas with gelatino-bromide emulsion is very easy, but it is very liable to peel off, and soon goes stale. The following is very excellent, and the prepared canvas can be kept for months before applying the silver :

Iodide of potassium.....	80 grains.
Bromide of ammonium.....	35 “
Chloride of ammonium.....	10 “
Gelatine	60 “
Albumen	1 ounce.
Distilled water.....	10 ounces.

Mix and gently warm until the gelatine is dissolved ; clean the surface of the canvas (if it be prepared for painting in oil) with ammonia $\frac{1}{2}$ ounce, methylated spirit 2 ounces ; apply with a soft cloth until the greasiness has disappeared, and allow to dry thoroughly ; then apply the above solution evenly with a clean sponge, and when dry sensitize with—

Silver nitrate.....	1 ounce.
Glacial acetic acid.....	½ “
Distilled water.....	12 ounces.

Pour a small pool of this in the middle of the canvas, and spread all over with a ball of cotton wool, and in about one minute and while still wet, expose—about one minute is enough for an enlargement of six times—and develop with—

Gallic acid.....	60 grains.
Acetate of lead.....	10 “
Distilled water.....	10 ounces.

Filter and apply in the same manner as the silver solution, and then with the same piece of cotton wool (then throw it among the residues), for the little silver it contains will give vigor. When this is completed, rinse, and fix in hypo 4 to the pint of water, and wash; the fixing and the wash after can be accomplished by allowing the canvas on its stretcher to float face down, and the canvas need not be detached from its stretcher at all by the use of this process, and the image will not strip under any circumstances. A modification of development is, after the paper is sensitized, to directly apply the developer and allow it to soak for a minute. Then place the canvas in position and expose. The development will then proceed with the exposure and can be watched by the aid of a lighted thin taper; and, when all the details are out, you may strengthen with a little fresh developer. No loss from incorrect exposure by this method.

[From the British Journal of Photography.]

THE NEW BENZOLINE LIMELIGHT.

BY ALBERT W. SCOTT.

(Continued from page 412.)

V.—THE WARM BATH SATURATOR.

HAVING discussed the theoretical principles of the new limelight, we may now proceed to consider the application of the theory to actual practice.

The first warm bath saturator, described in the second article of this series, consisted of a closed stuffed vessel placed in a bath of warm water heated by a spirit lamp. This apparatus was successful in its way, but was not perfect, at least for use with benzoline.

For benzole it is probably the best contrivance, as boiling water temperature is precisely that which is desirable for that fluid.

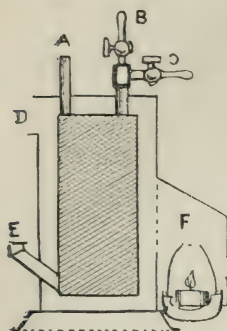
Benzoline, however, requires less heat than benzole, and, unless thoroughly drained, the heat of boiling water would be too much for it. The fluid does not boil over, nor give off steam, but it has a tendency to get into the air tubes, and thus cause the light to flicker by obstructing the free passage of the gas through the stuffing.

In starting the apparatus, the wick of the lamp was turned up so as to give a large flame. In about ten or fifteen minutes the water became of a suitable temperature, and it was then necessary to reduce the size of the flame considerably, so as to give just the small amount of heat requisite to keep the water warm. If the water became hot enough to scald, it was too hot; hence, it will be seen that the apparatus required watching, and, although capable of first-class results in skilled hands, it was not well adapted for the use of amateurs and unskilled persons, who have usually enough to do with manipulating the lantern. What was wanted was a saturator which could be easily and quickly started, and which would require no further attention during the exhibition.

Various patterns of warm bath saturators, very different in appearance, though working on the same principle, were successively made and tested. It was found that all were, more or less, practicable, but they were not equally advantageous. It will be unnecessary to describe the discarded forms. We may

at once proceed to the plan finally adopted, which appears to satisfy every requirement.

The illustration gives a sectional view of the apparatus, which is extremely simple in its construction and also in its working.



The shaded oblong in the center is a section of the saturator proper, a vertical copper cylinder, about 3 inches in diameter and 7 inches in height. This is tightly stuffed and packed inside with a species of wool, capable of absorbing a large amount of fluid—nearly a pint. The lower part of the cylinder is packed solid, as it were; the upper part of the stuffing is perforated and traversed by the tubes through which the gas passes. These tubes are not shown in the sketch.

Three pipes—A, B and E—are fitted to the outside of the cylinder. E is a short, wide tube, which projects at an angle from the lower end, and is fitted with a screw cap at the tip. This is used for filling the vessel with fluid. The object of having it at the bottom is to prevent over filling. The liquid rises in the stuffing by capillary attraction, and when the stuffing has absorbed its due quantity, no more fluid can be put in. By this device the tubes in the upper part are always clear and open to the passage of the gas; there is no bubbling and no unsteadiness of the light.

After filling the saturator the vessel is tilted to let the surplus fluid run out of E back into the bottle. Very little will come out—only an ounce or two; and it is not absolutely necessary to drain the vessel. After draining, the screw cap, which should be provided with a good leather washer, is screwed down tightly to prevent leakage of fluid or gas.

The air tubes in the stuffing are in connection with two pipes, A and B. The former, A, is a short tube, half an inch in diameter and two inches long. It is closed by a cork when the apparatus is not in use, but during an exhibition the cork is removed and one end of a short rubber pipe is slipped on, the other end of which is attached to the hydrogen nozzle of a jet or dissolving tap.

The third pipe, B, is connected in a similar way by rubber tubing to the oxygen nozzle of a jet or dissolving tap. It is furnished with a stopcock, which is shut off when the apparatus is not in use, to prevent evaporation of the fluid.

A branch tube, C, also furnished with a stopcock, is fixed permanently on to B. The C nozzle is attached by a long rubber pipe, preferably not less than five feet in length, to a gas bag, though a short pipe will suffice if a cylinder of compressed oxygen is used. The stopcock on C should be turned off until the light is wanted in the lantern.

It will be observed that oxygen from a gas bag enters C and divides into two currents. One part goes through the stuffing, becomes loaded with vapor, and proceeds through A on to the jet, where it burns precisely as if it were coal gas with a smoky flame. The other part of the oxygen does not go through the saturator, but proceeds directly through B to the jet as pure oxygen.

The stuffed copper vessel has now been fully described. We may now consider the warm bath. This is simply a cylinder of sheet metal made larger than the copper vessel, which is placed in its center, leaving a space between the two for water or air, preferably the latter. The air case has two openings or flues: one at D, at the upper end, forms the exit flue; the other, opposite F, admits a current of warm air, which circulates around the copper vessel, and is finally discharged from D.

By this means the upper part of the copper vessel is gently warmed; but the lower, to which loose liquid drains, remains quite cold. This is a great advantage, because there can be no boiling and no steam. The upper part may be

heated considerably beyond the boiling point of the fluid used with perfect safety, so long as the lower part, to which the fluid is driven by the heat, remains cool.

The source of heat is a large nightlight, having two wicks, known as Clarke's Fairy Light. This is held in a little ornamental glass cup and cover, called the Fairy Lamp. These lights are perfectly safe and sure; they do not flicker, cannot be blown out when in the lamp, and can be had of any grocer at a penny each, burning six hours. The fairy lamp is held in a little box, F, which is hung outside the air case in such a way as to be removable in a second should anything go wrong with the light—an unlikely occurrence.

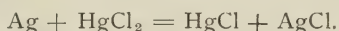
[From the *Photographic News*.]

ON CONTROL IN THE DENSITY OF NEGATIVES.

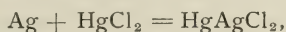
BY CHAPMAN JONES, F.I.C., F.C.S.

(Continued from page 171.)

CHEMISTRY OF THE CHANGES: THE ACTION OF MERCURIC CHLORIDE.—As mercuric chloride is the first reagent employed, it appeared to be important to discover the change that it brings about. It is generally stated that when mercuric chloride reacts with the silver of the image, silver chloride and mercurous chloride result.



As I have not been able to find any record of a specific proof of the truth of this reaction, I treated a quantity of pure precipitated silver by grinding in with mercuric chloride and water, and repeating and grinding at intervals during a few days. The product was washed, and consisted chiefly of a pure, white powder, but mixed with a coarse, gray powder of probably unacted-on silver. As much of the white product as was deemed advisable was separated by elutriation, dried at steam heat, and found analytically to contain 37.75 per cent. of silver chloride, the amount needed by the above equation being 37.86 per cent. This result was confirmed by other methods, such as the quantity of mercury salt taken up, and the weight of product obtained from a given weight of silver; therefore there is no room for doubt that the commonly accepted reaction is correct so far as the matter of proportion goes. The properties of the product, however, both chemical and physical, point to the conclusion that it is not a mixture of the two chlorides, but a definite double chloride. This matter is still under investigation, but, acting in the light of evidence already to hand, I will, for present purposes, regard the substance as a definite compound, writing the equation that represents its production—



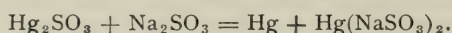
and postpone any further consideration of the matter.

THE ACTION OF SODIUM SULPHITE.—The action of sodium sulphite upon mercurous silver chloride is commonly stated to result in the solution of the silver chloride and the reduction of the mercurous chloride to the metallic state. This I believe to be entirely incorrect, though there appears to be sufficient ground for having provisionally accepted the idea. In the quotation given above from Dr. Eder, one would naturally infer that this was the change, and text-books of chemistry very commonly state that sodium sulphite reduces mercurous chloride to the metal. It is also well known that silver chloride is dissolved by sodium sulphite. But the reaction before us is not equal to the

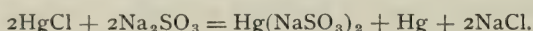
result of the action of sodium sulphite upon mercurous chloride and silver chloride separately; the silver is not dissolved, the mercury is not reduced, and the sodium sulphite apparently does not play the part of a reducing agent.

Concerning the action of sodium sulphite on silver chloride alone, there is little that calls for remark. The silver chloride is dissolved, and there seems no reason to doubt the commonly accepted statement that a double sulphite is produced, or perhaps more than one.

The action of sodium sulphite upon mercurous chloride has been studied conjointly by Dr. Divers and Mr. Schmidz (*Journal of the Chemical Society*, XLIX, 533). They found that there was at first a transient blackening due to the formation of what they call hypomercurosic sulphite, and formulate thus: $\text{Hg}(\text{SO}_3)\text{Hg}_3$. This formula halved and written empirically becomes identical with mercurous sulphite, Hg_2SO_3 , and there appears to be no conclusive reason why the production of this compound should not be expressed by the simple equation $2\text{HgCl} + \text{Na}_2\text{SO}_3 = \text{Hg}_2\text{SO}_3 + 2\text{NaCl}$. But excess of sodium sulphite so readily attacks the mercury salt that it cannot be prepared by taking any precautions from mercurous chloride, the final products of the change being mercuric sodium sulphite, which dissolves, and a residue of metallic mercury, thus:

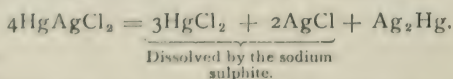


For practical purposes, therefore, the action of sodium sulphite upon mercurous chloride may be stated to produce mercuric sodium sulphite and metallic mercury, and the whole change may be expressed thus:



It is important to notice that the sodium sulphite does not play the part of a reducing agent at all, for it is not oxidized: and that half the mercury is dissolved, the other half remaining as metal. I have confirmed the truth of this reaction so far as identifying the mercuric sodium sulphite in the solution by the properties it is stated to possess, and I have proved analytically that half the mercury is dissolved, and that the other half remains as metal. If, therefore, it were possible to exchange the silver image of a negative for mercury, it would not be possible to increase the amount of metal by the action of mercuric chloride followed by sodium sulphite. The contrary of this has been stated by some writers on photographic subjects.

The action of sodium sulphite upon mercurous silver chloride does not appear to have been investigated. The current and incorrect idea has been referred to above. My investigation of the reaction is not yet so complete that I can give a proved equation to represent it, but it is not likely that further work will discover results of practical interest to the photographer. When sodium sulphite reacts upon mercurous silver chloride, the whole of the chlorine goes into the solution; three-fourths of the mercury and half the silver are also dissolved, and one-fourth of the mercury and half the silver remain in the metallic condition to form the image. The action may be represented thus:



The Ag_2Hg remains to form the image, and the mercuric chloride and the silver chloride are taken up and doubtless changed by the sodium sulphite in a way

that might easily be conjectured; but, as I have not yet proved by experiment the compounds that are formed, it is better to leave it an open question for the present. I have also proved that the silver and mercury are actually present in the above proportion in a negative intensified by mercuric chloride followed by sodium sulphite, by an estimation of the metals present in the film. It will be observed that this method of intensification results in an exchange of half the silver of the image for mercury, four atoms of silver (4Ag) yielding, after the action, two atoms of silver and one of mercury (Ag_2Hg). This generally results in a slight increase of density, but not always; it appears to depend upon the physical condition of the film and its image whether or not the exchange of half the silver for less than its own weight of mercury ($216:200$) will give increased density; but personally, I have found that there is an intensification effect in the vast majority of cases.

There are statements concerning this method of intensification that I have not been able to confirm. First, by repeating the operation any density can be obtained. This is probably the assertion of a mere theoretician who argued from false premises. I have repeated the process six times on a plate, and the density is greatest where it has received only one treatment. It has been pointed out above that so far as mercury itself is concerned, the action of these re-agents does not increase its quantity. Secondly, that a negative intensified by this process may be reduced by immersion in a solution of sodium hyposulphite. I have never found this to be the case, even by prolonged treatment (one hour), nor can I see any reason to expect reduction under these circumstances.

There is what at first appears to be an anomalous property of the image resulting after the application of this intensifier, namely, that it is invariably darkened to a slight extent by the application of ferrous oxalate to it. As the solution of the chloride of silver in sodium sulphite, as shown in the above equation, is not very stable, it may be that a little silver chloride remains attached to the image, and that this is reduced to the metallic state by the ferrous oxalate, but the fact remains that, even by prolonged treatment with fresh sodium sulphite solution, I have been unable to eliminate whatever it is that leads to this effect.

It may be worth while recording here that if mercurous silver chloride and sodium sulphite are allowed to remain in contact for some days, the residue is chiefly silver instead of Ag_2Hg . This fact has probably no photographic significance.

(To be continued.)

NOTES ON PIZZIGHELLI AND ARISTOTYPE PAPERS.

BY F. J. HARRISON.

PRINTING on platinum paper, especially on the printing out paper prepared after the formula given by Captain Pizzighelli, is now becoming deservedly popular because of the beauty of its results and the simplicity of working. To obtain the best results it is necessary that the paper should be slightly damp when put into the printing frame. This can, of course, be done by holding the paper in steam from boiling water. But very few of us can have steam when it is most required, and when on tour or in the summer time it is by no means an easy thing to procure. But the same effect may be produced by placing the

Pizzighelli paper in a newspaper sheet folded four times and dashing water with the hand on the upper and lower outside sheets. In a few minutes, five at the most, the platinum paper is ready for use.

Aristotype prints with a glacé finish are to many a terrible trouble to mount. But lay them one on the other on a piece of waxed paper (which, I think, can be purchased at any grocery store), paste the upper one, dry the hands thoroughly, and lay it in position on the mount. Lay over it a piece of clean waxed paper, rub down with a roller, and the thing is done. Paste the others one at a time, and serve them in a similar way.

These remarks may need an apology because of their simple character, but until lately these two things had been to me drawbacks in two beautiful printing processes.

THE GRAND PRIZE AT WASHINGTON.

WE here give a reproduction of a photograph of the grand prize of the Photographers' Association of America, awarded to G. H. Hastings, of Boston, Mass., at the Washington Convention. The negative from which the plate was



made is the work of Mr. Hastings, and is an admirable view of the great trophy. Who would not belong to such an association with such a prize to win, and who would not strive for such a prize?

OUR ILLUSTRATION.

OF all landscape photographers H. P. Robinson, of Tunbridge Wells, England, is the acknowledged chief. From the earliest of his efforts to the present time he has shown a love for landscape work and a power to satisfy that love

that has given to the world some of the finest specimens of the photographic art. With this issue of the BULLETIN we give four reproductions in photogravure of some of his many fine efforts. The reduction of the plates has, of course, taken away much of the beauty of the originals; nevertheless, they give the wonderfully artistic feeling found in the silver prints from which they were made.

For the interest of those who would like to secure some of the original silver prints made by Mr. Robinson, we would say that our publishers are the American agents for them and can supply them. Write to them and not to the editors of the BULLETIN.

THE DAGUERRE FUND.

SUBSCRIPTIONS ARE STILL IN ORDER.

THE following is a partial list of the contributions to the Daguerre monument as far as we have received notice of them up to this date. We shall take pleasure in adding to this list as the names are sent to us. These are in addition to the money raised by dollar subscriptions :

Dr. A. H. Elliott, \$25; G. Cramer, \$500; E. & H. T. Anthony & Co., \$500; W. V. Ranger, \$10; W. G. Entrekin, \$100; C. H. Codman & Co., \$100; Benjamin French & Co., \$100; G. Gennert, \$50; Rhinehart (City of Denver), \$50; Sheen & Simpkinson, \$25; D. P. Thompson, \$25; L. W. Seavey, \$25; Hetherington & Coover, \$25; *St. Louis and Canadian Photographer*, \$25; S. J. Dixon, \$25; G. D. Milburn, \$25; Brodie Mfg. Co., \$25; John W. Morrison, \$25; D. R. Coover, \$25; Fowler & Slater, \$25; Catherine Weed Barnes, \$20; S. L. Stein, \$20; L. C. Overpeck, \$10; L. J. Ullman, \$10; Mr. A. J. Riddle, \$10; *Photographic Herald*, \$10; Ph. Bonte, \$10; J. R. Pearson, \$10; Baker's Art Gallery, \$10; F. E. Hastings, \$10; Buffalo Argentic Paper Co., \$10; J. G. Edgeworth, \$10; E. M. Estabrooke, \$10; Loney & Gable, \$10; E. J. Pullman, \$10; G. H. Van Norman, \$5; W. Stuber, \$5; E. Stanton, \$5; J. M. Brainerd, \$5; E. Fieger, \$5; A. W. Judd, \$5; Eddy Bros., \$3; G. L. Hurd, \$2; T. M. Mackey, \$1; J. R. Clemons, \$1; Bausch & Lomb Optical Co., \$20; J. M. Appleton, \$25; M. A. Seed Dry Co., \$100; R. H. Moran, \$25; Geo. Murphy, \$20; F. W. Guerin, \$10; Arthur, \$10; C. Gentile, \$10; C. W. Motes, \$10; Benjamin Brothers, \$5; Elrobora, \$5; E. Decker, \$5; S. B. Brown, \$5; Eugene Smith, \$5; F. Plotser & Co., \$5; M. G. O., \$2; Geo. Sperry, \$2; Adam Heimberger, \$2; Charles E. Craven, \$2; J. E. Smith, \$2; J. C. Fitzgerald, \$2; W. E. Eusten, \$2; W. Noel, \$1; L. M. Jackson, \$1; S. F. Sloan, \$1; A. M. Wiggins, \$1; J. W. Vance, \$1; A. M. Collins Mfg. Co., \$100; John Carbutt, \$100; M. Carey Lea, \$10; *The Photographic Times*, \$100; "Kicker," \$5.

[From New York Times.]

PAPER FOR PHOTOGRAPHERS.

EVERY schedule of the new tariff law has its job. Sometimes the way for a job was prepared by the change of a word, as in the case of knitted underwear, and the completion of the work was left to the officers who should interpret and apply the law. Sometimes the work was done by the conference committee, as in the case of the box proviso inserted by Mr. McKinley at the request of the

new Window Glass Trust. Sometimes the conferees followed the example set by a similar committee in 1883, and coolly raised a duty about which there had been no disagreement.

By such interference with a matter concerning which the Senate had expressed its satisfaction with the action of the House the duty on albumenized paper used by photographers was raised from 15 per cent. to 35 per cent. For this reason, as stated by E. & H. T. Anthony & Co., in a letter which we publish elsewhere,* the price of such paper has been of necessity largely increased, at an annual cost of more than \$100,000 to the photographers of the country and the people who buy photographs.

The official copies of the McKinley Bill at the several stages of its progress show clearly when and by whom the trick was played. The duty on albumenized paper under the old law was 15 per cent., that rate having been fixed by a decision of the courts after the customs officers had sought to collect a duty of 25 per cent. In the McKinley Bill, as reported to the House (paragraph 423), the duty on "albumenized and sensitized papers" was fixed at "25 per centum ad valorem." It was passed by the House in that form. The Senate Committee on Finance reported the duty to the Senate in exactly the same words, and in those words it was passed by the Senate.

To the conference committee was sent the bill as passed by the House and the bill as passed by the Senate, each containing these words, "albumenized and sensitized papers, 25 per centum ad valorem," as shown in paragraph 422 of the bill accompanying the committee's report—the same paragraph that had originally been numbered 423. All of the official copies of the bill show clearly that there was no disagreement about this duty. Both the Senate and the House had passed it without changing a word or a figure.

But the Republican conferees, whose labors should have been confined to rates as to which there was a disagreement, decided that they would overrule the Senate and the House in this instance. They raised the duty from 25 per cent. to 35 per cent., and placed "albumenized and sensitized papers" in paragraph 419, where it may be found in the law. Their action was final, for the decisive vote was upon their report as a whole.

More than 20,000 reams of this albumenized paper are used in this country every year, and only 400 reams are made here. Dresden is the center of production, and the standard qualities of the raw material are made at one factory in France. The committee of New York importers told the Senate Committee on Finance that there was only one factory in this country, in which were employed about a dozen persons, who had been brought over from Dresden, and that the owners of this factory had not been able to make a satisfactory quality of paper at any price. The members of the Senate Committee were also told that the proposed increase of duty—then an increase to 25 per cent.—would simply "increase the burden of the tariff upon the thousands of proprietors of photograph galleries throughout the country." A few days afterward these same Senators joined Mr. McKinley and his associates in the conference committee in playing the trick we have described.

Of course, the price of albumenized paper has risen, and of course the Republican journals all over the country have told complaining photographers that there was "no excuse in the new tariff for any advance," and that the

* See letter at end of this article.

change of price was simply one result of that "vile conspiracy of Democrats and alien importers" to "put up prices on the eve of the election." But every photographer can see how the cost of Dresden paper in this country is increased when the duty to be paid on it at the Custom House is raised from 15 per cent. to 35 per cent. of the foreign value.

[From *New York Times*.]

A BURDEN TO PHOTOGRAPHERS.

THE INCREASE IN THE DUTY ON ALBUMEN PAPER WILL NOT HURT THEM.

To the Editor of the New York Times :

In the issue of *The Times* of this morning there is quite a serious error which we trust you will correct, in the statement there made that the McKinley Tariff Bill increases the duty on photographic albumen paper from 15 to 25 per cent., as the increase is from 15 to 35 per cent., or double the amount which you state. As a consequence, it has been necessary to increase the price of albumen paper very largely, and to an extent that will take fully \$100,000 annually from the pockets of photographers throughout the country.

It may be interesting to your readers to know that, when it was proposed by the framers of the McKinley Tariff Bill to increase the duty to 35 per cent., thousands of petitions were sent by photographers from all parts of the country to their representatives in Congress, and as a result the duty was fixed in the bill, and passed by the House, at 25 per cent. It also passed the Senate at the same rate. The conference committee, however, which is generally supposed merely to adjust the differences between the bills as passed by the two houses, quietly increased the rate of duty to 35 per cent. in the conference report, and it was rushed through without being noticed at the last moment at this rate, and the bill was signed by the President with the rate advanced to 35 per cent.; and now the consumers must, as quietly as they can, bear the burden imposed by those who are supposed to represent their best interests in Congress.

Under the former tariff bill albumen paper was originally assessed at 25 per cent. as "paper not otherwise specified," but we brought suit against the Government to have the duty reduced to 15 per cent. on the ground that photographic albumen paper was a manufacture of paper, and entitled to entry at that rate accordingly. The case was tried in the United States Courts and decided in our favor, and only 15 per cent. duty has been paid up to the enforcement of the McKinley Bill. The appraisers have frequently stated that the duty should be 25 per cent., notwithstanding the decision of the United States Court on the subject, and it has been threatened to appeal the case to the United States Supreme Court, but this has never been done. We presume that it is on this account that the statement appeared in a comparative report to Congress, showing the difference between the rates of duty under the act of 1883 and the proposed rates under the McKinley act, in which report albumen paper was stated to be subject to a duty of 25 per cent., whereas, as a matter of fact, only 15 per cent. had been collected since the decision of the courts above referred to.

The increase of 20 per cent. in duty is, in our view, an absolutely unnecessary burden to photographers, and we trust that you will give this correction of your error as great publicity as possible, since it would mislead many into the idea that the tariff had been increased only 10 per cent., and the price of albumen paper more than 10 per cent., whereas the fact is, the tariff has been increased 20 per cent., and the price of albumen paper in less proportion, as the importers have preferred to share the burden with the consumers in the hope that a new tariff bill would eventually be enacted which would remove this unnecessary burden.

E. & H. T. ANTHONY & CO.

NEW YORK, Monday, November 10, 1890.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.
and a corps of practical assistants.

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E. & H. T. ANTHONY & CO., Publishers.

PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

WASHINGTON—LAST SESSION.

(Continued.)

Mr. GENTILE—It has been assumed that this Association is liable for the money, and I think some provision ought to be made to meet this.

Dr. ELLIOTT moved an amendment to the motion that the whole question of debt be referred to the Executive Committee with power, which was seconded.

W. H. H. CLARK—I do not see why any motion is required. This Association is holden for the debt. There are a good many firms to be heard from yet who are doubtless willing to give, and while the debt is assured the debt is just as good as paid.

(Mr. Gentile withdrew his motion.)

Dr. ELLIOTT—Then I move that this whole question of debt be referred to the officers and Executive Committee, with power.

(Seconded and carried.)

The President—It is suggested that probably the new committee will continue the awarding of the Grand Prize for an illustration of a poem, and if any of you have a short

poem to suggest, it will be gladly received and considered; or you can mail it to Mr. Hastings at Boston.

Dr. Elliott said that two poems had been suggested: "The Village Blacksmith" and the "Cotter's Saturday Night."

The President—There are several matters I wish to speak of before the conclusion of this Convention. The general satisfaction which has been expressed in regard to the Convention, we assure you, is very flattering to us, but we do not care to take credit to ourselves. I want, in this public way, to express personally my appreciation to the other members of the Executive Committee for their very able support in this work. Mr. Hastings, Mr. Ranger, Mr. Coover, and Mr. Carlisle have stood shoulder to shoulder with me, and I thank them. I want to extend personally my thanks to the officers of this Museum, without whose attentions we would not have been able to have held this Convention in this city; and we feel very grateful to Professor Goode and his assistant, Mr. Earle; Mr. Horn and his assistant, Mr. Stewart; and last, but not least, Professor Smillie. I wish also to extend thanks still further down the list, and include all the assistants of the institution, even to those who have moved the heavy weights, etc. I also want to extend my personal thanks to Professor Mason for his kind, welcome and courtesy; also to the men who have given us such valuable papers, namely, Professors Wilson, Todd, Mendenhall, Loomis, Taylor, and to Mr. J. Scott Hartley for his unique work in criticizing art work from an artistic standpoint. I wish personally to thank those who have prepared papers on different subjects. I want to say that we have never received from the press of any city any more favorable attention, if as much, as has been given here.

I want to thank our photographic journals and the members of the Association at large for your very kind forbearance in our shortcomings, and I hope we may have the pleasure of meeting you times innumerable, and that the friendships here formed may be lasting for all time.

Miss C. W. Barnes suggested the poems Jean Ingelow's "Songs of Seven" and Byron's "Prisoner of Chillon."

L. G. BIGELOW—I dislike to see this Convention close without some action being taken towards the Photographers' Home. If we could manage our finances so as to provide a sinking fund and each year add something to it, a few years would result in something.

Dr. ELLIOTT—I think it a very important point to consider. We want headquarters. I simply suggest some ideas as to what it should be. There should be an office for our Executive Committee and officers to work in; a library with the best books pertaining to photography, etc.; a place of storage for the reports and archives of the Society; a place where we could put these pictures we have agreed to take care of; then after all that is done, we might have a laboratory where researches could be carried on in photography and science.

I would move that a committee of five be appointed to take into consideration the desirability of having a permanent home, and to devise a plan for carrying it out, reporting at our next convention.

(Seconded and carried.)

(The committee consisted of Dr. A. H. Elliott, New York; G. Cramer, St. Louis; C. W. Motes, Atlanta; L. G. Bigelow, Chicago, and W. C. Entrekin, of Philadelphia.)

Mr. Heinig suggested that exhibits for the Grand Prize be limited to one picture instead of three, as heretofore.

Mr. Hurd thought three pictures none too many.

Mr. Bigelow thought the item of expense was to be considered; for that and other reasons he would support the suggestion.

Mr. Stein thought six pictures would be better than three to illustrate any ordinary poem.

Dr. Elliott asked how it would do to reduce the size and not the number of pictures.

Mr. Haarn thought that a poem well studied could, by putting two or three strong points together, be illustrated by one picture.

The President said that it might be better to introduce this suggestion to the committee, that they might use their discretion and be guided thereby.

After some discussion by Messrs. Ullman, Savage and others, for and against, the President said that he thought it was the idea of some very prominent photographers to lower the number of exhibits, but that it seemed to be a question hard to settle.

C. W. Motes moved that the matter be referred to the Executive Committee.

(Seconded and carried.)

The President—A diploma has been offered for the most tastefully arranged exhibit; the committee will report later in our journals.

The committee recommend a diploma for the exhibit in colored pictures, to be given Ullman & Co.

The President, after making announcements in regard to trips, railroad certificates, etc., stated that the motion to adjourn was in order.

Moved and seconded that the Convention adjourn.

(Carried.)

President Appleton then announced that this Convention stood adjourned *sine die*.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

THE regular meeting of the above Section took place on November 5th, being postponed from the 4th, because of election day. Owing to the illness of Mr. Newton, Mr. Van Brunt occupied the chair. There was a very large attendance, and the meeting was a particularly pleasant and interesting one.

The Secretary acknowledged the receipt of various photographic publications, and also of a package of circulars relating to an exhibition to be held in Liverpool from March 6th to April 4, 1891. A letter was read from the Syracuse Camera Club, discussing the desirability of establishing a central organization for amateur photographers, and inviting delegates to a conference to be held in the rooms of the Society of Amateur Photographers in December. On the motion of Mr. Mason, Messrs. H. J. Newton and C. Van Brunt were appointed to represent the Section.

Several photographs by members and friends of the Section were on view, and were passed around. Mr. Mason trusted that this would become a general feature of the meetings.

Mr. Becker exhibited a camera devised by himself, with a view to obtaining compactness and portability. The wooden bed and front of the ordinary camera were replaced by brass rods, and the box when closed was remarkably compact. The focusing cloth was permanently attached to the ground-glass frame, and served also as a wrapper for the camera. The tripod was made up on the fishing-rod pattern, and was very rigid and light.

Mr. F. J. Harrison exhibited Anthony's New Magazine Camera, explaining its construction and the method of working it. The simple pressure on a button, concealed beneath the handle, removes an exposed plate, storing it away in a magazine and bringing a fresh plate into position. The shutter is a remarkably simple and effective contrivance,

being set by simply pushing a lever to one side. During the process of setting, the shutter is not opened. A small additional box is furnished, by which the camera can be re-loaded and emptied in daylight without the slightest risk of exposing the plates.

Mr. Harrison also exhibited two shutters, one the Low shutter, which is placed on the lens hood. Two flies are opened by pressure on a pneumatic bulb, and any length of time may be given. By pushing a small catch to one side instantaneous movement is obtained. The second shutter exhibited was the Low "Kazoo" shutter. This is a marvel of ingenuity. When used for instantaneous work it requires no re-setting after use, being always ready. The insertion of a small pin converts it into a time shutter.

Considerable interest was shown in these exhibits, and the speaker was applauded at the close of his remarks.

Question—Where can these shutters be obtained?

Messrs. E. & H. T. Anthony & Co. are the sole agents.

Mr. SOLOMON—It is really surprising to what perfection photographic appliances are attaining. This camera and these shutters excel anything I have ever seen.

Mr. MASON—It is a source of gratification to us to have these appliances brought before us. They promote discussion, and are a source of considerable advantage to both exhibitor and members present. I am sure I am only expressing the opinion of all when I extend a most cordial thanks to Messrs. Becker and Harrison.

An interesting series of slides were then shown on the screen by Mr. Fisk, of which two, one in illustration of Dickens's "Dick Swiveller," and the other "Marguerite," from "Faust," were particularly good, both for composition and for technical excellence. A number of slides by Dr. Bartlett, illustrative of his European tour, were also very interesting.

A large and varied programme was announced for the next meeting, December 2d, and a hearty invitation was extended to all present and to their friends.

The meeting adjourned at 10 P. M.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

THE monthly stated meeting of the above society was held November 11th, at 113 West 38th street, Mr. A. L. Simpson in the chair.

The minutes of the last meeting being read and confirmed, Mr. T. C. Roche gave a demonstration of the primuline process.

Primuline is an aniline dye, and from 15 to 20 grains are dissolved in an ounce of water. The temperature of the water being raised, fine silk, calico or paper are immersed in it for five to ten minutes. Wash and immerse in a solution of nitrate of soda and acid. The material now becomes of a salmon color and is washed and dried in the dark room. Expose under a negative until the color bleaches and then develop. Development with pyro yields red tones; with eikonogen, purple-blue. Wash well after development. The better the paper is sized, the more brilliant is the result. Clear whites cannot be obtained, there being as yet no method for the entire removal of the yellow ground. By this process a negative is obtained from a negative and a positive from a positive.

Mr. Roche compared this process with the ferric oxalate process. By coating paper with ferric oxalate, printing and development with silver nitrate, fine black prints with clear whites can be obtained.

Mr. Roche was still experimenting with primuline. He intended trying the effect on primuline prepared gelatine plates.

The chairman thanked Mr. Roche on behalf of the meeting for his able demonstration, the vote of thanks being carried with acclamation.

Mr. D. C. Hoover exhibited an apparatus for the rapid exposure of bromide paper. The light from an oil lamp is reflected by means of a mirror placed at 45 degrees through the negative, over which the bromide paper is stretched. After exposure, the paper is rolled off, fresh taking its place. By an ingenious device the proper amount is ruled off each time.

Mr. Beach showed a box of his own design for the safe carrying of lantern slides. The wooden grooves were replaced by thin strips of India rubber. Packed in this way, fifty slides occupied a space of only 11 inches, instead of 16 to 18.

Mr. Beach also exhibited a quarter size magazine camera, the invention of E. W. Snyder, of Washington.

Mr. A. P. Smith showed a method of doing away with the ordinary lantern slide mat by blocking out the portion of the plate desired for the picture and exposing first for the mat and afterwards for the picture. Mr. Smith also stated that he had been able to obtain clear eikonogen from colored crystals by wash-

ing it for some hours with a neutral solution (composition not stated), adding sulphite of soda and filtering.

After some remarks from Mr. Walker, past-president of the society, the meeting went into executive session. A revised constitution was read and will be taken up at the next meeting.

For the convention on December 4th, called by the Syracuse Camera Club, Messrs. Simpson, Walker, Beach and Stebbins were elected to represent the society. The meeting adjourned at 10.30 P.M.

CHICAGO LANTERN-SLIDE CLUB.

THE lantern-slide makers turned out well at the October meeting, and as it was the collection night for the Interchange box, the entire evening was given to trying the pictures by limelight.

The first lot shown were made by Mr. Burton Holmes, from his summer vacation abroad, and included a large variety of beautiful studies in France, Italy and Germany. Mr. Holmes will so show the entire set with descriptions and incidents.

The majority of slides shown were made with eikonogen and varied in tone.

Following Mr. Holmes' slides were a score from negatives made by Mr. Charles P. Stivers, while visiting the Yellowstone region, comprising geysers, cañons, valleys and mountains—slides made by reduction from 5 x 8 negatives, developer oxalate, and few slides show better than these. Members of interchange clubs will have the pleasure of seeing this entire set this winter.

The balance of the box was made up of landscapes and composition work around Chicago.

The same contributors as have heretofore been known were present, and a few new ones besides. The officers feel gratified at the completion of this fourth box, and expect a pleasant series of picture treats. The managers of the Interchange sent the programme for the season, and members were pleased to note a few foreign sets promised.

If the lists accompanying each set will give the developer used, the comparisons will be more closely watched.

Eikonogen seems to have taken pretty strong hold upon our members—one or two only retaining the oxalate as their choice.

W. A. MORSE, *Secretary*.

BROOKLYN ACADEMY OF PHOTOGRAPHY.

IN spite of the pelting rain a fair sized audience assembled at the Hoagland laboratory,

October 23, in response to an invitation from the Academy of Photography, when Frank La Manna, President of the Academy, came forward to speak a few words of welcome. He said that the work of the academy had gone on steadily increasing in interest, at least, and, whether in excellence, he would leave those present to judge when they should see the pictures to be displayed.

At the close of Mr. La Manna's remarks the pictures were thrown upon the screen in rapid succession. Owing to the absence of several of those who had furnished slides, the descriptions were necessarily dispensed with. The work, as a whole, was among the best that the academy has so far exhibited, and the improvement in the matter of development and manner of treatment of subjects was noteworthy to a marked degree. The committee in charge of the exhibition was composed of Messrs. Wintringham, Arnold and Wheeler, and the views were made by the following members of the academy: W. M. Arnold, views in Connecticut; Willis Dodge, view at Mauch Chunk; Hugh M. Eaton, views on the Maine lakes and coast; Harry T. Fowler, views in the White Mountains; Frederick M. Lawrence, views in river and harbor; Starks W. Lewis, departures of ocean steamers; Dr. John Merritt, views at Great Neck, L. I.; Joseph B. Morrisson, views in North Carolina; Gonzale Poey, views in Ulster County, N. Y., and H. Allen Smith, views at Litchfield, Conn.

The pictures represented in many cases are the places where the producers had sojourned during the summer. Some of camping parties were extremely good. Among the country views there were many particularly beautiful field and lane pictures which carried the beholders back to the days of July and August. There were also excellent pictures of scenes at Mauch Chunk, the Delaware and Hudson canal, with some good views of things to be seen in the White Mountains. Lake George was disclosed in some of its quiet beauty to splendid advantage, and the pictures of West street and a big French liner as she pushed off from the pier, and a further view as she was passing down the bay, were finely executed.

NEW ORLEANS CAMERA CLUB.

THE annual meeting of the New Orleans Camera Club, held on November 5th, at the spacious headquarters of that popular organization, was well attended and possessed more than ordinary points of interest, it being the

first annual gathering held by the club since it moved into its present quarters.

President Horace Carpenter occupied the chair, and Mr. R. S. Charles, Secretary of the club, was at the desk, and when the meeting was called to order a large number of members answered roll call.

Secretary Charles read the report of the Governing Committee, which showed that it had been found necessary to complete the fitting up and equipping of the club room, dark room and gallery. With the assistance rendered by Messrs. Carriere and Mitchel, this work was completed to the satisfaction of the committee.

Secretary R. S. Charles' report was next submitted, and showed that last year there was a total of seventy-eight members in the club. Since that date forty-one new members had been added to the roll, and the present membership of the club was put at one hundred and seven. Mr. Charles, in reporting upon the selection of Miss C. A. Huard as custodian of the club, stated that the presence of a lady in the rooms served to make the visits of ladies to the gallery more numerous and more agreeable.

The report continues:

The success of our house warming or public reception last April, as well as the recent and only outing of the year, no doubt remain familiar to all, and renders it unnecessary to refer to them except to recommend that during future outings our members bestir themselves and endeavor to increase our membership. * * * The reputation of having the most complete dark room throughout the United States has reached us in various forms, probably the most gratifying of which was by the receipt of a communication from the Hoboken Camera Club, requesting that plans, etc., be sent them for use in building their new club house. With all facts and figures before us, we feel that the club ought to be congratulated upon the successful efforts made in the last year to bring it forward, and we venture the remark that its affairs are now on a substantial basis.

In conclusion, we thank the members for their courtesy and willingness to give a helping hand whenever in their power. Very respectfully,
R. S. CHARLES,
Secretary.

The report of the Lantern Slide Committee showed that eleven displays had been given in the past year, and that everything appertaining to that part of the club's business was in the best of condition. The season for dis-

plays will begin in December instead of November 1st, as heretofore, and the exhibits for the ensuing year will be of slides contributed by the following members of the Interchange: Philadelphia Photographic Society, Society of Amateur Photographers of New York, Pittsburgh Amateur Photographers' Society, Cincinnati Camera Club, St. Louis Camera Club, Chicago Lantern Slide Club, Louisville Camera Club, Newark Camera Club, Syracuse Camera Club, Amateur Photographic Society of Baltimore, Pacific Coast Amateur Association and the New Orleans Camera Club.

Treasurer P. E. Carriere reported that on the first of the year the club had a balance of \$384.97 on hand. Receipts since that date amounted to \$1,864.35, making a total of \$2,249.32. The disbursements during the year were \$2,101.66, leaving a balance on hand of \$147.66.

A vote of thanks was tendered to Mr. David Rosenberg for the donation of a handsome 8 x 10 camera.

A resolution was adopted thanking Mr. Walter F. Crosby, of New York, for the copy of his beautiful picture entitled "Innocence,"

YONKERS CAMERA CLUB.

For two hours nearly five hundred ladies and gentlemen sat in Music Hall, October 31st, and gazed at a big screen at the back of the stage, on which were exhibited two hundred and twenty pictures from lantern-slides made from negatives taken by members of the Yonkers Photographic Club. It was a very pleasurable exhibition, free from the slightest suggestion of tiresomeness; and the pictures were of such excellence that almost every one was received with demonstrations of appreciation and admiration.

G. Livingstone Morse prefaced the exhibition by making a short speech explaining the plan of the club for the exhibition. Hundreds of slides had been submitted to the judges—Artists Arthur Parton, James Renwick Brevoort and Roswell D. Sawyer; and they selected of these what they considered the most meritorious in each class. There were three prizes in each class, and the judges also determined the winning slides. Their verdicts were given without the slightest knowledge on their part as to who were the photographers. Each competitor was numbered, and his number was known only to himself and the President, John W. Alexander, who gave it. There were eleven classes of pictures for which prizes were to be awarded.

Class A, landscapes, produced the most competition, over one hundred slides having been submitted, of which fifty-six were shown on the screen. The first prize was a bicycle camera; the second and third prizes in this and in each of the other classes were diplomas.

In Class B, landscapes with figures, the prize winners were as follows: First, No. 1, "A Toiler of the Fields," by Rudolf Eickemeyer; second, "Haying," also by Eickemeyer; third, "In the Shandaken Valley," by F. W. R. Eschmann.

Class C, animals—First, "Thoroughbred," by Walter Blackburn; second, "Caught in Mischief," by Eickemeyer; third, "Very Attentive," by George S. Stengel.

Class D, marines—First, framed engraving, "Breaking Away," by Blackburn; second, "Surf at Quogue," also by Blackburn; third, "The Freshening Breeze," by Robert M. Reeves.

Class E, genre, or composition pictures—First, "A Tyroliar," by Eickemeyer; second, "Rest After Meat," also by Eickemeyer; third, "Engraver at Work," by Frank Gardner.

Class F, portraits—First, "A Six-Year-Old," by Theo. L. Jabine; second, "A Greek Head," by Eickemeyer; third, "She Gives a Side Glance and Looks Down," also by Eickemeyer.

Class G, interiors—First, "A Study," by Stengel; second, "A Study," also by Stengel; third, "Hall at Boradale," by Gardner.

Class H, still life—First, "Sunshine and Shadow," by Stengel; second, "Perfume and Poetry," by Eickemeyer; third, "Catherine Mermets," by Stengel.

Class I, detective camera work—First, "War Canoes—Alaska," by Andrew S. Brownell; second, "The Tomato Gatherer," by Eickemeyer; third, "Sunset at Sea," by John W. Alexander.

Class K—First, "Out for All Day," by Eschmann; second, "Straight for Home," also by Eschmann; third, "View on Lake Mahopac," by Alexander.

Class M, figures—First, "The Confidante," by Eickemeyer; second, "In the Merry Month of May," also by Eickemeyer; third, "A Sunny Day," by George B. Wray.

Forty slides of local scenes, for which no prizes were given, were exhibited as the closing feature of the entertainment. Among these were a group of members of the Yonkers Bicycle Club before a race, by Dr. Charles A. Miles; scenes from the late performance of "Pinafore," Commodore A. J. Prime, the

Corinthian Yacht Club House; and "Getty Square in the Blizzard," by Blackburn; "Part of Morsemere," by George S. Pentz; "The Hudson From Glenwood, Looking South," by Salter S. Clark; "The Yonkers Club," by S. Hedding Fitch; "Nepperhan Avenue," by Alexander R. Taylor; "Purser's Pond," by George B. Ritter; "Residence of William Allen Butler," by Alexander; "Rocky Ridge, Parkhill," by Brownell; "The Worthington Church," by Morse.

The other club members who had pictures exhibited during the evening are: William Dean, Charles F. Timm, Meinrad Benziger, Harry Oakley. J. Osgood Carleton, Otto C. Beer and William M. Warner,

The final representations were, first, a life-like picture by Byron Barker, of John W. Oliver, holding up in one hand the plan of the Soldiers' and Sailors' Monument; and second, a large picture of the Monument alone. As the Monument Fund is to receive a share of the net proceeds of this entertainment, these pictures were very appropriate, and were warmly applauded.

Mr. Morse made the announcements of the titles of the slides; and names of the artists, and also designated the prize pictures. Occasionally he would intersperse bright remarks. The picture of "The Cherubs," by Taylor, announced to have been two separate negatives joined, was really of one child taken in two positions on one negative—a feat for which the artist deserves credit.

An excellent portrait was shown of John Bright, Manager of Music Hall, with his cornet to his lips. As the picture remained on the screen Mr. Bright played behind the scenes a cornet solo, giving the air "A Father's Love," from Balfe's opera of "Lurline." Upon the hearty applause of the audience the picture was changed quickly to another, showing the performer in the act of gracefully bowing his acknowledgments. This was a very pleasing surprise, and made a great hit. Mr. Bright played "Remember Me," from Balfe's opera of "The Bohemian Girl," as an encore piece.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—E. J. S. writes: Please tell me how to treat photographic silver prints to make them lie flat, like those issued unmounted by the Soule Co.

A.—A very good way is to burnish them

before they are quite dry, and use a pretty heavy card to carry them through the burnisher. To overcome the tendency to curl, moisten or soak the prints in a 2 per cent. solution of glycerine, after the final washing; allow them to become nearly dry and then burnish them.

Q.—D. H. H. writes: Will you please answer in the BULLETIN the following questions: If an amateur buy 1 ounce of pyro, is it best to keep the pyro in the dry state, or should the pyro be at once made into stock solutions with sulphite of soda; *i. e.*, which way will the pyro acid keep best, in the dry state or dissolved in water containing the usual amount of sulphite of soda?

A.—Pyrogallol (or indeed any of the modern organic developers) always keeps best in the dry state. In solution it rapidly absorbs oxygen, and becomes dark-colored and useless. The sulphite of sodium in the solution is for the purpose of retarding the oxidation of the pyro; but it also has an important influence on the color of the negative, which is more or less yellow without it.

Q.—F. G. A. writes: What makes the film slip off dry plates about the time they are completely fixed?

A.—This effect is what is called "frilling," and can be overcome by placing the plate in a half saturated solution of alum, containing about 1 dram of hydrochloric acid in a quart, just after washing from the developer and before fixing. Wash the plate after the alum bath and before putting into the fixing solution.

Q.—T. K. writes: Will you be kind enough

to answer me the following questions through your BULLETIN? What book is the best to get the information about the printing of silver, carbon, enamel, platinum, wood, silk, porcelain and so forth? And please tell me also, if it is not out of your subject, about the book telling of photo-engraving process.

A.—As you wish to know about the several methods of printing, we think it would be wise to get the following volumes separately, no one book giving sufficient information alone: "Silver-Printing," by Abney & Robinson; "The Carbon Manual," and the "Silver Sunbeam." For photo-engraving get "Wilkinson's Photo-graving and Photo-etching." All these volumes can be obtained from the publishers of the BULLETIN.

Views Caught with the Drop Shutter.

GUILLAUME & Co., of Paris and Chicago, send us a number of exceedingly handsome examples of their photo-engraving work. These are zinc etchings of lace and other materials, and show some of the best results in this line of work.

"LIFE," a novel. By W. W. Wheeler, the photographer, of Meriden, Conn. This is one of the first examples that we know of where a photographer has written a novel. The book is of the advanced type of thought, *a la* Edward Bellamy *et seq.* It is not our province to criticise it, but we note its appearance *en passant*. It is well printed on excellent paper, and makes a handsome volume.

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Empire Photo Engraving Co. N.Y.

View of Gordilleras, Chile.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D.
Prof. ARTHUR H. ELLIOTT, Ph.D., F.C.S.

DECEMBER 13, 1890.

Vol. XXI.—No. 23.

SOME POINTS OFTEN OVERLOOKED IN TONING.

THE image formed on the albumen paper after printing is of such a complex nature, and the effect of the gold in the toning bath upon this image leads to such a variety of results, that a little attention to some of the chemical points involved will well repay the time so spent.

Upon the surface of the paper that carries the picture we have three distinct substances, the result of the action of light upon the surface to produce the image from the negative. The first of these is the changed compound derived from the so-called albuminate of silver; the second is the metallic silver resulting from the action of light upon the chloride of silver in conjunction with nitrate of silver; and the third is the unaltered silver chloride. There is also more or less silver nitrate upon the paper, and whose presence has to be recognized when the color of the print after toning is desired to be of some special shade.

Beginning with the albuminate of silver, we find that the light has an action upon it that results in the production of a peculiar reddish-brown shade of color, and that this color fades out under the influence of time, even without the agency of light. This appears to be the cause of the deterioration of the old silver prints in our albums. Some experimenters have suggested the use of gelatine as a basis for the silver compounds that are to form the finished pictures. But here we also have practically the same changes going on in the organic compound of silver and gelatine that are inherent in the albumen basis. Furthermore, those who have had any experience with gelatine films will remember another source of trouble that is very characteristic of them, the disintegration of the gelatine itself. This is readily seen in the examination of old Woodbury-types and similar processes where the gelatine will be found more or less cracked, and its surface is covered with fissures that spoil the appearance of the pictures even after a very few years. This latter defect is apparently not true of albumen at least not after many more years than is true of gelatine. Gelatine appears to become hard and brittle with age, while albumen does not. It would appear, therefore, that in spite of its many defects, and since the fashion for glazed prints still holds its own in the public estimation, albumen paper is destined to remain the basis for the general production of photographs. We must, therefore, carefully study to handle it to the best advantage, and the reddish-brown shade of the exposed albuminate of silver not being agreeable to the eye, our methods of toning are based upon processes for modifying its color.

The second constituent of the printed image mentioned above is metallic silver, which has a more or less steel gray color according to the depth of the deposit upon the surface. The color of this material is such that although it modifies the color of the exposed albuminate of silver, it is not sufficiently intense to give an agreeable shade; and, furthermore, in the subsequent process of fixing the color of the albuminate is so much intensified that the influence of the metallic silver is practically nothing in modifying the color of the print. But this metallic silver in the print gives us a means of overcoming the objectionable color of the albuminate by a process of substitution. We cover up the offensive tints by adding others, in the same manner that a laundress adds bluing to the linen to mask the yellow tinge of the natural fibers.

To tone the print we have to act upon this fine deposit of silver with a solution of gold chloride, in this manner replacing the silver with metallic gold. And the manner in which we effect this substitution will determine the color of the finished print. If we hasten the process, and make the gold replace the silver rapidly, we shall get a blue or black tone; if, on the other hand, we retard the action of the gold solution, we shall make the particles of gold smaller, and the resulting tone will have a more or less reddish tinge. Toning baths containing gold chloride with borax or sodium carbonate will achieve the first result, a bluish or black tone, provided the prints are deep enough and the action is not continued until the high lights become slate-colored. This tone is often an agreeable one for portraits, especially if stopped at the purple tinge. But for landscapes there is a decidedly more agreeable result to the eye if the tones verge upon the brown shade. Natural scenery contains a far greater number of brown and gray tints than any others; hence black or bluish landscapes appear cold and unnatural.

To obtain the best results with landscape prints, and to obtain brown tones, requires much more skill and practice than is generally supposed. If the toning bath is too strong, or too warm, it will work rapidly, and instead of getting the red color of slowly deposited gold, the blue variety is obtained. On the other hand, if the bath is weak, or too cold, the process is slow and tiresome, and the prints deteriorate upon the surface from long exposure to the action of the chemicals. All things considered, a bath of gold chloride with sodium acetate is the best to use. But a difficulty often arises in obtaining the best results, which is probably due to the character of the sodium acetate used. This salt is usually made from commercial acetate of lime by the action of sodium sulphate, which, by double decomposition, gives sodium acetate and calcium sulphate. The latter compound is insoluble, and the solution of the sodium acetate is purified by crystallization. The source of danger in the sodium acetate comes from the original lime acetate. This latter material is made from pyroligneous (crude acetic) acid, the result of the dry distillation of wood, and it usually contains considerable quantities of wood tar. If, therefore, sodium acetate is made from this material, it also will contain traces of the constituents of wood tar, even after purification by crystallization. When we remember how minute a quantity of organic substance will affect gold chloride, we are constrained to believe that many of the troubles of the acetate gold bath may be caused by the traces of tarry impurities in the sodium acetate. To overcome these difficulties it is best to use fused sodium acetate in the toning bath, and any difficulties that might possibly arise from the presence of tar are eliminated, because the tar com-

pounds are volatilized by the heat of fusion of the salt. When the fused salt is added to the toning bath it is only necessary to use two-thirds of the weight called for by the formula, since, by fusion, the salt loses about forty per cent. of water of crystallization. The fusion of the acetate is a very simple matter, and it is entirely unnecessary to apply to the photographic stores for it. All that is needed is a clean porcelain dish that can be heated upon a fire or over a blue gas flame, taking care to begin the heating slowly, and allow the dish to cool slowly, otherwise fracture is inevitable. Cooling on asbestos felt is a good method, or on good dry sand which has been warmed.

Only two other points that are important come to us at this time: for blue or black tones, the prints should be washed free from silver nitrate, before being placed in the toning bath with borax or sodium carbonate; a good method is to use water made very slightly alkaline with ammonia. For brown tones all the silver nitrate should not be removed, and two changes of clean water are generally sufficient.

To the older members of the fraternity, what we have said above is well known; but for the rising army of the craft, we hope the above remarks may prove food for thought.

EDITORIAL NOTES.

At a recent meeting of the Camera Club of London, a number of very interesting points relative to platinum printing were elucidated by Mr. Lyonel Clark, who said among other things that while in his book on "Platinum Toning" he recommends the use of arrowroot in the salting solution, he has come to believe from more thorough experiments that gelatine is better for the purpose than arrowroot, as, with gelatine, greater uniformity can be obtained, and the bath can be used several times. The gelatine he finds can be used again and again, as long as it will continue to come to a jelly on cooling. Eight grains to the ounce, and in very bright weather only six, he finds to be ample. For ordinary work Mr. Clark uses the ordinary chloride bath, but for very strong prints he prefers the ammonia-citrate bath. The salting solution should be kept as hot as possible by keeping it in another dish of hot water. A camel's hair brush he recommends for salting stiff paper before floating, and advises leaving the paper in a place where it may absorb a little dampness over night. Care should be taken not to allow any of the solution to get upon the back of the paper, and the nitrate should be in combination with the chloride to the extent of producing an excess of silver. A demonstration of his method of intensification of prints was one of the features of the evening, by means of which any tone, from sepia to black, through all the intermediate tones, were shown to be easily possible. Prints may be intensified either before or after toning, or need not be toned at all; and they may be toned and intensified several times over. More or less silver seemed only to affect the intensifying bath by making it quicker or slower. The method of procedure is as follows: The negative is printed only about one-half as much as ordinarily, then washed and toned, if desired; washed again, and developed with water 2 ounces, acetic acid 20 drops, and nitrate of silver solution, such as is used for silvering paper (5 or 6 grains). When the desired tone has been obtained the print is removed, fixed and washed. Strange as it may seem, the lighter the tone to be desired, the deeper must be the print.

A FINE collection of heliogravures and aquarel heliogravure work by Hanfstangl, and some beautiful instantaneous pictures by N. V. Angerer, were a feature of the recent exhibition of the Vienna Photographic Society.

IN view of the recent great demand and limited supply of platinum, we understand that Mr. Edison has taken the matter in hand, and expresses the firm belief that many new localities exist where it can be profitably mined, and that the existing conditions will shortly cause them to be operated.

THE Springfield Camera Club have elected the following officers for the ensuing year : *President*, John Leshure ; *Secretary*, W. M. Lester ; *Treasurer*, H. N. Bowman ; *Librarian*, C. C. Morgan. A photographic exhibition is to be held immediately and slide exhibition shortly.

THE following formula for a cadmium intensifying bath comes to us from good authority. Place the plate, for from fifty to eighty seconds, in—

Ammonia (s. g. 0.920).....	100 parts.
Distilled water.....	100 “

Remove, wash it and place in a bath containing—

Cadmium bromide.....	10 parts.
Alcohol (rectified).....	100 “

WE note with pleasure that our esteemed friend Mr. George G. Rockwood has been rewarded for his scientific study and research by the degree of Doctor of Philosophy. Mr. Rockwood is one of the only, if not the only, practical photographer who has the title Ph.D.

WE are in receipt from Mr. S. R. Stoddard, of Glens Falls, N. Y., of two sheets of miniature reproductions of photographs of the American Canoe Association, and a prospectus of his publication, “Glimpses of the A. C. A.,” which, from indications presented, will be a most tasty little volume.

THE programme of the Second Fall Exhibition of the Newark Camera Club, held at the Y. M. C. A. Hall, last month, is one of the most elaborate and handsome things of its kind that has come to our notice. The list of subjects is well selected and very comprehensive, and we more than ever regret that we could not have been present, as if the exhibition was in any degree commensurate with its programme, it would have been a delight.

WE are happy to extend our congratulations to our Toledo friends, who are among the latest to report the formation of a Camera Club. They start off with a good membership and bid fair to rapidly increase it.

Prof. CURTIUS, of Berlin, has discovered a new gas, which is very explosive in solution with water and some of whose compounds explode when exposed to light. It is capable of dissolving gold, and is compounded of nitrogen and hydrogen, N_3H . He has named it hydrazoic acid.

EXPERIMENTS in printing bromide paper under green glass tend to show that great advantages may be derived thereby, over-exposed negatives printing with much more vigor and a retention of the pure whites, which are unattainable in other ways. The exposure required is twelve or fifteen times as great as ordinarily.

THE New Orleans Camera Club have elected the following officers for the ensuing year: *President*, Horace Carpenter; *Vice-President*, Mr. A. L. DeQuenay; *Treasurer*, Mr. P. E. Carriere; *Secretary*, Mr. R. S. Charles.

AN ENTIRELY NEW PRINTING PROCESS:—THE “DIAZOTYPE,” OR PRINTING IN PRIMULINE.

BY W. JEROME HARRISON, F.G.S.

FOR the last two or three weeks I have been practically working a new printing process, which has, as I believe, a future before it; and about which I feel sure that the readers of the BULLETIN will like to know something.

To this process the name of “Diazotype” has been given by its inventor, Mr. Arthur G. Green, and its first public announcement was made by him at the British Association meeting held in Leeds in September last. The process is a patent one, and a license to work it (costing half-a-guinea), must be obtained from the patentees, Messrs. Green, Cross & Bevan, of 4 New Court, Lincoln’s Inn, London, W. C. The actual manufacturers of the new dye used in the process (primuline), are Messrs. Brooke, Simpson & Spiller, Atlas Works, Hackney, London, who only supply it to the patentees.

Primuline is a rather dark yellow powder, of extremely complex composition, being an alkaline salt of sulphonic acid. It has already come into extensive use for dyeing calico.

Operation I—Dyeing.—On receiving a specimen of primuline, I weighed out a quarter of an ounce and added it, together with 5 grains of common salt, to a quart of water which was already boiling in a glass vessel. I had previously obtained a few yards of very fine calico “warranted free from dress,” which I had cut into suitable pieces and soaked well in several changes of water. Placing the calico in a porcelain dish the boiling dye was poured upon it and in a few minutes it appeared thoroughly impregnated. The strips of calico were then removed, rinsed in plain water, squeezed as dry as possible, and finally dried under pressure between blotting-paper.

The calico so prepared has a primrose hue, whence the name primuline, from *primula*, the primrose; so far it is quite insensitive to light.

Operation II—Sensitizing.—We next require a solution which shall give off nitrous acid. This is obtained by mixing 30 grains of sodium nitrite with a pint of cold water and adding to it 50 grains of oxalic acid, previously dissolved in an ounce of water.

The strips of dyed calico are dipped separately into this solution and well soaked in it; they are then rinsed in water and again dried. The calico is now of a reddish-yellow hue, and is sensitive to light, hence this operation should be performed in a dark corner. It is not of much use to work in the ordinary dark-room by red or yellow light, for—according to my observation—the diazo-

tized primuline is sensitive to all the colors of the spectrum. It is certainly more easily affected by light than ordinary sensitized paper, taking only about half the time to print.

Operation III—Printing.—This primuline process is remarkable, inasmuch as it yields a negative from a negative, and a positive from a positive. As a positive print on the calico will usually be preferred, put a glass transparency in a printing-frame; place the diazotized calico in contact with it and expose to daylight (in dull weather) for about twenty minutes. The image ought then to be visible in light-yellow outlines, but very faint.

Operation IV—Development.—Several developing baths may be employed, according to the color which it is desired the print shall finally be :

RED.

Betanaphthol.....	30 grains.
Caustic soda.....	40 “
Water.....	½ pint.

ORANGE.

Resorcin.....	20 grains.
Caustic soda.....	30 “
Water.....	½ pint.

BROWN.

Pyrogallie acid.....	30 grains.
Water.....	½ pint.

BLACK.

Eikonogen.....	50 grains.
Water.....	½ pint.

PURPLE.

Naphthylamine.....	60 grains.
Oxalic acid.....	6 “
Water.....	½ pint.

[With this purple bath dip the print (after developing and rinsing) into a solution of tartaric acid, 50 grains to the pint of water, and iron at once.]

MAROON.

Betanaphthol disulphonic acid.....	40 grains.
Caustic soda.....	50 “
Water.....	½ pint.

YELLOW.

Phenol.....	50 grains.
Water.....	½ pint.

Other colors can be obtained, but these are all that I have, so far, personally experimented with. The colors obtained are full, rich and pleasing.

Development is effected by simply dipping each print in turn, for a few seconds, in the solution.

Operation V—Washing.—After development it only remains to rinse the prints well in water. They may then be squeezed in a lather of soap and water, rinsed again, and finally dried, under pressure, between sheets of blotting-paper. By subsequently placing them between dry blotting-paper and ironing them with a hot iron, they are smoothed and their appearance is improved. As far as the time has permitted me to test, the results are permanent.

Printing on other Materials.—Either silk, wool or linen may be used instead

of calico ; but as the solutions do not enter the fibers of these substances so readily as they do cotton, a longer time in each solution must be allowed, say quarter of an hour in the dyeing solution and two or three minutes in each of the others, *Paper* works as quickly as calico, but it must be floated on the surface of the various baths, not dipped into them, as when wet it tears too easily.

To produce transparencies on glass or celluloid, coat the plates with a solution containing—

Gelatine.....	1 ounce.
Primuline.....	80 grains.
Chrome alum.....	2 “
Water.....	1 pint.

When dry dip the coated plates into the sensitizing bath for five minutes, then wash well for five minutes and allow to dry. The remaining operations are exactly the same as described for prints on calico.

Production of Different Colors on the Same Print.—By mixing a little of each developer with some starch, so as to thicken it, and then applying locally with a brush, all the colors mentioned can be obtained on one and the same print. The only color which has not yet been obtained is green. The process bids fair to be an extremely cheap one. Even at present prints on calico can be produced at a cost of about one farthing apiece. Its uses for decorative purposes seem endless, and it will probably displace the “blue” process for the use of architects, draughtsmen, etc. One drawback is that, up to the present, a white “ground” has not been obtained ; it always has a yellowish tint.

REVERSED POSITIVES.*

By COLONEL J. WATERHOUSE, B Sc., *Assistant Surveyor-General of India.*

Reversed Positives with Thio-carbamides.—During the past month further experience has been gained in obtaining reversed positives with thio-carbamides in the developer, and some improvements have been effected ; though the method seems too uncertain to be considered thoroughly practical. As the phenyl-thio-carbamide appeared to be more regular in its working than the others, the experiments have been almost entirely with it.

It has been found that at present temperatures (about 80 degrees Fahr.) 1,000 parts of distilled water take up about one part of phenyl-thio-carbamide. Also that it is advantageous to use a smaller quantity of this thio-carbamide in the developer than was first recommended, and that from 12 to 15 parts of the saturated solution, as above, in 100 parts of the eikonogen developer are quite sufficient. By using more the ground becomes darkened, and it is difficult to get clear lights.

The preliminary bath of dilute nitric acid at 5 per cent. is decidedly useful in copying work, and it is also advisable to use the bromide of copper bath at 2 to 3 per cent. before fixing. It may be noted that a preliminary treatment with the bromide of copper solution before development destroys the image. For landscape work also the nitric acid treatment is an improvement, but the best working conditions have not yet been ascertained. Bichromate of potash does

* From author's corrected proofs of the *Journal of the Photographic Society of India.*

not seem to answer so well as a preliminary oxidizer with phenyl-thio-carbamide as nitric acid, and does not give good results when added to the developer. It seems to work better with thio-sinamine.

Ferridcyanide of potassium added to the developer, in the proportion of 2 to 4 parts of a 10 per cent. solution to 100 of eikonogen developer, containing the usual proportion of phenyl-thio-carbamide, acted as a strong restrainer; and, though it gave complete reversals, it did not seem to exert the clearing and intensifying action of the nitric acid. The images obtained with it are weak and of a chocolate brown color. Further trials are, however, requisite.

The weather during the month has been hotter and damper than before, and very much against work with dry plates.

Thio-sinamine and thio-carbamide in the eikonogen developer, with preliminary treatment with nitric acid or bichromate of potash, have not given good results for copying line-work, and phenyl-thio-carbamide seems best suited for this purpose.

Under favorable circumstances the process seems likely to be useful for line-work. For half-tone work, either copying or landscape, it is much more uncertain, and a good deal more work will be necessary to ascertain the best working conditions for insuring certainty, if, indeed, it is possible to do so.

At present these conditions seem to be:

To use as little as possible of the reversing agent with the minimum of exposure; not to use more bromide than is necessary; a fairly strong eikonogen developer, and a preliminary treatment with a suitable oxidizing agent.

With the hydroxylamine developer neither phenyl-thio-carbamide, thio-sinamine, or thio-carbamide show any reversal, but it may be noted that thio-sinamine seemed to stop the evolution of gas in the film and the consequent blisters, but the image was not very strong. Glucose also is useful in this respect. It acts as a restrainer, and gives a very fine deposit of good color, but rather wanting in density. Manna acts in a similar manner, but is not so strong a restrainer.

Reversing Action of Sodium Thio-sulphate with Ferrous-oxalate Developer.—In my paper last month the reversing action of hyposulphite of soda with the ferrous-oxalate developer, noticed by Professor Eder, was alluded to. It was forgotten, however, that some very clearly reversed positive images had been obtained last year on "Ilford" plates, developed with ferrous-oxalate developer, containing a fairly large proportion of hyposulphite; and, though similar results have been obtained in the same way quite lately, it has been found on further trial that the hyposulphite plays no active part in the reversals, and, indeed, they are in some respects better without it.

With Ilford plates exposed on a view for about 30 minutes, sufficient to show a faint but quite visible image, ferrous-oxalate has given very perfect reversals; in some respects even better than those obtained with the thio-carbamides. Though not so bright, and of a blacker color, there is more perfect gradation, the lights are generally clearer, and there is no solarization about the sky-line. A lightning conductor against the sky comes out sharp and clearly reversed, which has seldom been the case with the thio-carbamide reversals, unless the plates have been under-exposed.

Similar reversals have been obtained with pyrogallol and eikonogen developers with about the same exposure, but not so clear in the lights.

It may be noted that, on developing one of these over-exposed plates with

an eikonogen developer containing phenyl-thio-carbamide, the same reversal took place, and the further action of the thio-carbamide did not change it into a negative, though it fogged over.

The long exposures necessary for obtaining perfect reversals in this way render the method almost useless for practical purposes, unless some means can be found for accelerating the action. If the reversals obtained with short exposures by means of the thio carbamides were as perfect as those produced by long exposure, the problem of obtaining positives in the camera would be solved.

[From *Photographisches Wochenblatt*.]

THE PRIMULINE PROCESS AND FEER'S TREATMENT OF THE SAME.

BY DR. O. N. WITT.

IF we look into the present state of photography, we find an almost general harmony in the form and application of the negative process, a proof that, upon the whole, it gives satisfaction ; with the positive process it is otherwise. Here the most varied processes become fashionable and disappear again. We see that the same photographer favors one process to-day and another to-morrow, a sure proof that every one of these processes has still certain defects ; no matter whether they are in the difficulty of execution, defective results, or the perishable nature of the picture obtained.

It is by no means intended in the following sketch to introduce a new process to the reader ; on the contrary, we will call attention to two processes still in their infancy, and which claim general interest, because they endeavor to accomplish their purpose in two entirely new ways.

If we consider the numerous positive processes heretofore known, we will find that they have one thing in common : the picture carrier (paper in connection with starch, gelatine, white of egg, gum, etc.) is regularly an organic body, an oxygen compound, whereas the picture producer, the colored deposit, of which the picture consists, is always of an inorganic nature, because it consists of finely divided metals, metallic-salts or (in the pigment process) of finely ground carbon and other body colors.

For the new processes to be described, organic compounds as picture producers are selected from the group of aromatic bodies, which has been known and celebrated for some time for its particular capability of furnishing coloring matters. All artificial and natural coloring matters are relatives of this class.

Synthetic chemistry has taught us a number of reactions by which coloring matters form from colorless mother-substances. The two positive processes to be described here are also due to such reactions, whose peculiarity is, that they are introduced and completed by light. This proceeding, under the influence of light, is common to both processes ; common to them also is the circumstance that the coloring-matters produced belong in both cases to the same class of bodies, namely, the azo coloring matters. But they are diametrically opposed in their manner of application.

In the Feer process, which is the older one, coloring matter is produced from colorless ingredients by the influence of light ; the process is, therefore, in its manner of execution, synonymous with most of the other printing processes, the silver, platinum and cyanotype, and it produces a positive picture from a negative, a negative copy from a diapositive.

The primuline process, invented by Green, Cross & Bevan, on the contrary, works with a body which, by itself, is capable by a simple treatment of conversion into coloring matter, but which loses this capability when exposed to light; therefore only those parts remain suitable for color formation which were not exposed to light. In other words, the process furnishes similar copies, from the negative a negative and from the positive a positive. Both processes have their value.

If we look now a little closer into the details of both processes, it might be preferable to describe first the more simple primuline process. It is known to all who have studied organic chemistry, that there are numerous so called amines, and that these, so far as they belong to the aromatic compounds, are easily changed into so-called diazo bodies by the influence of nitrous acid. These diazo bodies are subject to decomposition, and are even of an explosive nature in a dry condition; they are therefore not kept in stock but are prepared according to use by treating the corresponding primary amine with nitrous acid in aqueous solution. If such a freshly prepared aqueous solution of a diazo combination is brought into a solution of another amine or of a body from the class of phenols, a rich precipitate of an azo body will form at once. In this way the most different azo bodies can be produced; they are without exception very intense coloring matters, whose tones vary from yellow through orange and scarlet to carmine, violet, and even to blue, and certain laws govern these variations.

Almost all diazo bodies decompose gradually in the light, and thus lose the capability of uniting with amines and phenols to form azo colors.

It is the fortune of Messrs. Green, Cross & Bevan, to have discovered a diazo body, whose decomposition by light is so rapid that a photographic process can be based upon it. This application is much facilitated by certain peculiarities of the primary amine upon which this diazo combination is based, the primuline from which the process derives its name.

Primuline is the sulpho acid of a yellow-colored primary amine, known for some time as dehydrothioparatoluidine. It was discovered about two years ago by Green, who discovered also the remarkable property that it is absorbed from its aqueous solution by cellulose and other fibrous matters. If cotton or paper is immersed in an aqueous primuline solution, they will assume quickly a yellow color. The primuline connected in this way with the fiber can now be diazotized, like every primary amine, if treated with nitrous acid. If a piece of paper or cloth colored yellow with primuline is immersed in a solution of nitrite of soda mixed with acetic acid diazotized primuline will be on the paper or cloth. This can be dried in the dark without changing. If paper or cloth, treated in such a way, was to be immersed in a solution of an amine or phenol, azo-colors would form at once, and remain attached to the fibrous matter. Such diazotized primuline paper can be colored yellow in a phenol solution, orange in a resorcin solution, brown in a solution of phenylendiamin, carmine in a solution of betanaphthol, black-violet in a solution of alpha naphthylamine, etc.

The diazotized primuline fibers are extremely sensitive to light. If touched by light they will lose nitrogen, and the capability of forming colors in the above-mentioned solutions. From this results the photographic primuline process. The diazotized primuline paper or cloth, dried in the dark, is exposed under a positive, if a positive picture is desired, about two minutes in sunlight or half an hour in diffused daylight. It is then immersed in one or the other of the solutions mentioned, whereupon the picture appears at once.

The whole process is extremely simple. Its principal application might be found in the Lichtpaus process for maps and drawings. The defect, that the copies so obtained have no pure whites but a yellow ground, is here of little consequence, and is sufficiently balanced by the possibility of producing pictures of several colors, by applying with a brush on different parts of the picture the solutions furnishing different colors. The possibility of producing maps for buildings, etc., upon cotton goods which can be washed when dirty, should not be underestimated. The primuline process might also open a new field in the production of handsome colored ornaments upon cloth.

The inventors intend also, we are advised, to introduce paper and cloth colored with primuline into the market by way of a trial. The process is patented in all countries. Purchasers of these colored papers will therefore, very likely, have to procure at the same time a license from the inventors.

The likewise patented Feer process is based upon an entirely different principle. All diazo combinations have the tendency to unite with sulphite of soda to form so-called diazo sulphonic salts, handsome crystallized substances, in which the properties of the diazo combinations are completely hidden. They are very constant, do not explode, and also do not act upon amines and phenols, forming coloring matters. But if they are mixed with the latter, colorless liquids will be obtained, which can be spread upon paper. The paper can then be dried in the dark unchanged. But if now exposed to light, it will effect a destruction of the diazo sulphonic salt. The true diazo body is formed again and acts instantaneously upon the phenol present. The deeply colored azo body forms visibly under the influence of light. Here we need a negative if a positive picture is to be produced.

By Feer's process every azo color can, so to speak, be produced by the action of light. Any desired shade can also be produced. Particularly striking are scarlet-colored pictures which are obtained if the diazo sulphonic salt of pseudo cumidin is mixed with a solution of beta naphthol in soda lye, and spread upon paper, dried and exposed. If alpha naphthylamin is taken instead of beta naphthol, violet pictures will be obtained, and with resorcin orange-colored pictures. The pictures obtained with Feer's process show glossy white lights, but they sink too deeply into the paper and are then flat, a defect that should be removed. The future of this process is in the production of colored copies from negatives.

The future will have to decide about the practical value of both processes, but as they open an entirely new field they deserve our best consideration.

[From the *Photographic News*.]

ON CONTROL IN THE DENSITY OF NEGATIVES.

BY CHAPMAN JONES, F.I.C., F.C.S.

(Continued from page 693.)

THE ACTION OF FERROUS OXALATE.—In order to make quite sure of the processes that I am about to recommend, I have proved experimentally that a solution of ferrous oxalate reduces both silver chloride and mercurous chloride to the metallic state; and that ferrous oxalate solution removes all the chlorine from mercurous silver chloride and leaves the whole of both the metals as such.

PRACTICAL METHODS.—The method of getting control in density that I wish

most urgently to recommend to those who aim at getting good negatives with certainty is, to take care that in development the density of deposit never exceeds what is required, and then work up the negative to the best condition by the action of mercuric chloride followed by ferrous oxalate, repeating this process if necessary; or, if the intensification that would be given by these re-agents is conjectured to be too great, following, under certain conditions, the mercury solution with sodium sulphite. The important matter is that every effect shall be thorough, that every atom of silver in the negative may be acted upon in the same way and to the same extent.

I first recommended the use of mercuric chloride, followed by ferrous oxalate, in 1888, in the *Photographic News* (Vol. XXXII, p. 18), and in my "Introduction to the Science and Practice of Photography." During the last two or three years I have had considerable experience in the application of this process, and could have shown many negatives treated by it, but so far as appearance goes it is very doubtful whether any one could distinguish a negative so intensified from one not changed after development. To illustrate the effect, I have treated various parts of a thin, landscape negative, which includes sky, sea, distance, middle-distance, and foreground, up to four times.

The solutions that it is advisable to use are :

First.—A saturated solution of mercuric chloride, to which has been added two or three cubic centimeters of strong hydrochloric acid to each liter (or half a dram to each pint). No ammonium chloride or other salt should be added. There is no need to use mercuric bromide, as stated by Burton and Laurie, nor is the subsequent exposure to light specified by these gentlemen at all requisite. The operations may be carried on by daylight or gaslight, and, indeed, I have not found it necessary to pay any attention whatever to the light that falls upon the plate. After the mercuric chloride the washing must be thorough, generally about an hour or an hour and a half, with constant changes of water.

Second.—The ferrous oxalate is conveniently prepared by adding one part by volume of a saturated solution of ferrous sulphate to about six parts by volume of a saturated solution of neutral potassium oxalate. The potassium oxalate may be just acidified with oxalic acid, but acid tends to retard the action of the oxalate. The solution may be used weaker than above, but then it acts more slowly. The action of the ferrous oxalate is retarded if all the mercuric chloride is not washed away from the negative, though the addition of mercuric chloride to the ferrous oxalate solution does not appear to have any appreciable effect. If the action of the ferrous oxalate is made unduly slow, the reduced silver and mercury will tend to whiteness, as is also the case in a very slowly developed negative. The slaty color of the metals produced in extreme cases, especially at the glass side of the film, may lead an inexperienced operator to consider the action of the ferrous oxalate unfinished, although the reduction is complete.

Third.—The solution of sodium sulphite may vary as to strength within wide limits; a 5 to 10 per cent. solution is convenient. A little acid should be added to it, preferably sulphurous, until the solution ceases to give a red color to a dilute solution of phenol-phthalein. Litmus paper is useless in this case. For ordinary work it is sufficient to take advantage of the fact that if a good sample of crystallized sodium sulphite is dissolved with one-thousandth of its weight of citric acid, the alkali in it will probably be

neutralized. To be on the safe side, five times this amount may be taken, say half a gram of citric acid to one hundred grams of sodium sulphite, or two-and-a-half grains of acid to one ounce of sulphite. It is a mistake to say that a negative should be only just rinsed after treatment with mercuric chloride when sodium sulphite is to be used. The washing need not be so thorough as in other cases, but the more complete it is the more rapidly will the sulphite produce its effect.

We have already seen that mercuric chloride, followed by sodium sulphite, will not add to a mercury image, the operation leaving exactly as much mercury as there was originally; and as the effect of mercuric chloride, followed by ferrous oxalate, is simply to accumulate mercury upon the original silver of the negative, the intensifying action of the sulphite method becomes inappreciable after two or three applications of the oxalate method. This gives an additional uncertainty as to the intensifying effect of mercuric chloride followed by sodium sulphite; but the small amount of added density given by this method is often valuable, and the process has the advantage that if it does no good it does no harm, for the negative, after a thorough washing, is just as amenable to the mercury and ferrous oxalate as if the sulphite had not been used.

It will be observed that the reducing power (using the expression in a chemical sense) of the image is lessened by the application of mercuric chloride and sodium sulphite, the Ag_2Hg being able to take to itself only three atoms of mercury by one application of mercuric chloride and ferrous oxalate, while the original four atoms of silver could take four atoms of mercury. But the difference in density given by mercury and ferrous oxalate when applied to a negative before and after the use of the sulphite method is not practically appreciable.

I had hoped to have been able to give a more or less exact idea of the densities of negatives as varied by such treatments as have been described, but the visual opacity sometimes proves different from the retardation of printing processes. It appears that this may always be so; but whether or not, it is wrong in principle to attempt to estimate one effect by the measurement of another, when the two are not of necessity proportional. I have found also that the increase of printing density produced by the same operation varies somewhat according to the conditions under which the changes are effected. It may, however, be stated in practical language that one treatment with mercuric chloride and ferrous oxalate generally about doubles the opacity; that after a second treatment the result is about equal to that produced by the application of mercuric chloride followed by ammonia upon the original negative; and that mercuric chloride and sodium sulphite on the original gives a density about half way between the original and that treated once by the oxalate method.

Doubtless, if the manner of controlling density here advocated is adopted, some operators will find trouble; and in order, as far as possible, to forewarn those who appear to have a predisposition to fail, I have endeavored to discover all the drawbacks that beset the operations. If the plate darkens very slowly under the ferrous oxalate, and the oxalate is not unduly diluted or acid, the washing after the mercury salt has been insufficient. But at the same time it may be remarked that ferrous oxalate is much slower in action than ammonia or sodium sulphite. If the finished negative has a black-looking stain upon it, the ferrous oxalate has not been washed away, and a further washing will

rectify it. The removal of the excess of mercuric chloride is greatly facilitated if the mercury solution is poured off when the glass side of the film is gray, then a sufficient quantity of the solution is probably in the film to complete the bleaching. It is, however, important to make the bleaching thorough in the end, if a truly proportional effect is sought after.

The minor advantages of the use of the methods recommended might be set out in a formidable list. There is no tendency to frill, even with repeated treatments; the operations are clean, the negative is in no way stained, the shadows are not choked up, and the lights do not lose their gradation. The operations are reliable, and the results are permanent. In order to test this last matter, I heated an amalgam of silver, containing an equal number of atoms of each metal, at the temperature of boiling water for about twelve hours, with occasional weighing, and found that the volatilization of the mercury gave a loss equal to nearly one part in two hundred per hour—indicating a want of permanence. But a part of a developed plate that had been intensified by the mercuric chloride and ferrous oxalate method until it probably contained more than ten times as much mercury as silver, after heating in a steam oven for six days (forty hours) showed no sign of diminished density either on a varnished or an unvarnished part. The density, indeed, seems rather increased by the treatment, and this may be due to a shrinkage of the film brought about by the prolonged heating. Thus the gelatine confers an extraordinary permanence upon the otherwise slightly volatile mercury. It may be noted as a fact, though hardly an advantage, that after intensification by the methods advocated, a negative is as amenable to intensification by many and probably by all other processes as it was originally. But the greatest advantage of all is that these processes enable the photographer to work step by step up to the density he desires, with the full conviction that the character of the gradation of the negative is not altered.

NOTES ON THE REPORT OF THE LENS STANDARD COMMITTEE.

BY A. HADDON.

(Continued from page 476.)

In the discussion which followed, Dr. Edmunds was the first to speak, this being the third meeting, and he told those present that in considering standard screws they had three things to bear in mind: 1st, the diameter of the screw, and that in all cases this should be measured on the outside of the male screw, full diameter; 2d, the form of the thread; and 3d, the screw rate or pitch, *i. e.*, the number of threads to the inch; and that it was absolutely necessary to keep each one of these points separate and distinct. As regards the diameters of the screws, he would advise the English inch as the standard, as any one who wishes to make standard gauges can easily turn up a ring or plug gauge, and then compare it with the standards kept by the Board of Trade for this purpose, and in that way insure uniformity of manufacture and complete interchangeability. He would therefore most strongly advise any odd fractions of an inch that might occur in any of the sizes as at present manufactured to be abandoned, and the inch and simple sub-multiples, as $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2, etc., to be taken in their stead. In olden times, before the screw-cutting lathe was invented, Mr. Holtzapffel originated several forms of threads, and though these at the time were as perfect as could be expected under the circumstances, yet now that we have a more scientific method for originating screws, we should use and put aside these old forms. For brass work, where the maximum of strength is required, he had no hesitation in saying that an angle of 60 degrees was prefer-

able to any other, and that the top of the thread should be flat. The work could be turned down to the exact diameter and then screwed up; if the original surface between the threads was left so as to form the flat when finished, the screw would be of the required diameter. The form of thread recommended by the late Sir Joseph Whitworth was an angle of 55 degrees rounded at the top and bottom. This form of thread could not be surpassed for cast iron, but was not the best for other metals where the greatest strength was required. The number of threads was not so important so that it was uniform.

In answer to these remarks of Dr. Edmunds, it was pointed out that a flat top thread, in the case of photographic lenses, would be more likely to bind if it were bruised, and therefore the rounded Whitworth angular form of thread would be preferable on this account. Such chasers of the Whitworth form can be obtained all over the world from any respectable tool maker, while if an angle of 60 degrees were adopted the chasers would have to be specially made, which would considerably increase the cost. Dr. Edmunds agreed that these were very good reasons why the Whitworth thread form should be adopted, especially as the maximum strength in the case of photographic lens mounts was not required.

It was then proposed and seconded that since, from the statement supplied, the diameters of the lenses adopted at the last meeting were not exactly 1.5 and 2 inches respectively, but a small fraction larger in the one case and smaller in the other, those resolutions be rescinded in order to clear the way for further discussion and suggestions. This was put to the vote and carried.

It was then proposed that in all cases the English inch be taken as the unit of measurement. Carried unanimously.

It was then agreed that, in consequence of the difficulty of measuring internal diameters of flanges, etc., all terms of measurement be regarded as made upon the outside diameter of the male screw thread.

The next point discussed was whether the present smallest size of the Photographic Society of Great Britain standards, viz., 1.5 inch, was not too large for the mounting of lenses for hand cameras. The majority were of opinion that it was, and that a smaller size was necessary, and finally it was agreed to start with the smallest diameter 1 inch, and the next 1.25 inch.

It was next proposed, seconded and carried (by nine for and five against) that 1.5, 1.75 and 2 inches be the next sizes, and that the others rise by a half-inch up to 4 inches, and then by 1 inch, as prescribed by the Photographic Society of Great Britain.

It was then stated by some that certain lenses look over-mounted with a mount of 2 inches in diameter, and, in addition, it would enable those opticians who have up to the present issued lenses a little over 1.5 inch to make adapters which could fit 1.75 inch without increasing to any serious extent the weight or bulk of the lens mount, and this new intermediate size would be very useful for the double purpose.

It was then unanimously agreed that the form of thread should be that known as the Whitworth angular thread.

The last matter to be settled was the rate or pitch, and it was agreed that for the smallest sizes up to 3 inches inclusive, the number of threads to the inch should be 24, and for the $3\frac{1}{2}$ and upwards, 12 to the inch, these being the two thread rates recommended by the Photographic Society of Great Britain.

Mr. W. Taylor (Leicester) then proposed a series of standard adapters to carry any lens one size larger, and that these should be numbered; also that lenses, adapters, and flanges should be so adjusted that when the mount is screwed home in its flange, with or without adapter, the diaphragm, index or other fitting shall always stand in the same convenient position.

Report of the Committee, consisting of Messrs. W. Bedford, A. Cowan, Dr. Edmunds, Mr. H. M. Hastings and A. Haddon (Secretary), appointed to consider lens standards.

The Committee appointed "to consider the adoption of the standard lens fittings recommended by the Photographic Society of Great Britain, or to suggest

alteration of that system, and to take or indicate such steps as may be considered necessary for its effective establishment," now submit their report as follows :

We have carefully, with the aid of the leading opticians, gone into the matter, and hope that our recommendations will not only receive the sanction and support of this meeting, but be universally adopted by all who have given any thought to the matter and have convinced themselves that the system employed by opticians before the "Photographic Society standards" were recommended was every man has his own system, and therefore no uniform system.

We have not seen any reason to depart from the existing "Photographic Society standards," which, as far as they go, we adopt. The modifications hereinafter suggested are either in the nature of explanation or amplification of those standards.

1. We recommend that the English inch be taken as the standard of length with regard to all measurements with lenses, flanges, adapters and camera screws.

2. That the form of threads for lens mounts, flanges, adapters and screws be that known as the Whitworth angular thread, and in order that there may be no misunderstanding with regard to this we here add the specifications, so that any one, wherever situated, can originate this same thread.

The Whitworth thread is constructed as follows : Two parallel lines are drawn, separated by a distance equal to 0.96 of the pitch (distance between two threads), these are intersected by two sets of parallel lines inclined to each other at an angle of 55 degrees and meeting top and bottom, one-sixth of the total depth of the angular thread thus formed is cut off top and bottom and rounded down.

The attitude of the resulting thread is therefore 0.64 of the pitch.

3. That all measurements where screws are concerned be made on the outside of the male or plug screw when finished.

LENS DIAPHRAGMS.

We recommend :

1. That the aperture of the standard unit diaphragm have a diameter equal to one-fourth the equivalent focus of the lens and be marked "1," the approximate focal length of the lens or combination being engraved on the mount.

2. That diaphragms with smaller openings should have apertures diminishing in area to the extent of one-half the preceding one, so that the second diaphragm should be marked "2," indicating that twice the exposure is required when this stop is used compared with what would have been necessary had diaphragm "1" been used under exactly similar circumstances. The diaphragms should therefore be marked :

$\frac{f}{4}$	$\frac{f}{5.6}$	$\frac{f}{8}$	$\frac{f}{11.3}$	$\frac{f}{16}$	$\frac{f}{22.6}$	$\frac{f}{32}$	$\frac{f}{45.2}$	$\frac{f}{64}$	Etc.
1	2	4	8	16	32	64	128	256	Etc.

Should a lens not admit of a diaphragm with an aperture as large in diameter as $f/4$, nor exactly any one of the above-mentioned sizes, we still recommend that the largest diaphragm should be marked with a number in accordance with its area with reference to the unit, and that all diaphragms of smaller area be marked in conformity with the above series.

In the case of lenses having working apertures larger in diameter than $f/4$, the diaphragm with largest aperture should be marked in accordance with its value, and the next .25 or .5, if either of these be admissible, and then according to the series given above.

SCREWS FOR ATTACHING PHOTOGRAPHIC LENSES TO FLANGES AND ADAPTERS.

We recommend the following to be the external diameters of the screwed portions of the lens mounts for the attachment of the same to the flanges :

Diameter of Screw in Inches.	No. of Threads per Inch.	Diameter of Screw in Inches.	No. of Threads per Inch.
1	24	*3.5	12
1.25	24	*4	12
*1.5	24	*5	12
1.75	24	And upwards, advancing by inches.....	12
*2	24		
*2.5	24		
*3	24		

FLANGES AND ADAPTERS.

1. We recommend, in order to prove that all lenses fitting the same flange shall stand with their diaphragm indices or other fittings in the same convenient working position, that every ring or muff screw gauge shall bear a zero mark upon its face, and that such part of the lens mount as is desired uppermost be set to coincide with the zero when the lens is screwed home in the gauge.

For convenience and uniformity the zero should be placed where the thread becomes complete, *i. e.*, where the point of a tool cutting such screw gauge would lie in the plane of the ring face.

2. We recommend that standard adapters to carry any lens in a flange one size larger than its own be numbered as follows :

Number.....	1	2	3	4	5	6	7	8	9	10	Etc.
Inside Screw.....	1	1.25	1.5	1.75	2	2.5	3	3.5	4	5	Etc.
Outside screw....	1.25	1.5	1.75	2	2.5	3	3.5	4	5	6	Etc.

The standard adapters to be adjusted in the same manner as the flanges with regard to same convenient working position of diaphragm indices or other fittings of lens mount.

CAMERA SCREWS.

And, finally, we recommend in the case of metal screws used for attachment of camera to tripod, fixing rising front, or any other movable parts of the camera, that these should be of the form known as Whitworth angular thread, and of the following diameters and pitch:

Diameter.....	$\frac{3}{16}$ -inch	$\frac{1}{4}$ -inch	$\frac{5}{16}$ -inch	$\frac{3}{8}$ -inch
No. of threads per inch.....	24	20	18	16

The report was received with considerable applause, and Mr. A. Cowan moved, and Mr. F. A. Bridge seconded, its adoption. Mr. Dallmeyer then spoke with reference to a report which had been drawn up by the signatories to the letter which appeared in our last issue, and which Mr. Conrad Beck then read to the meeting, this report differing in many important particulars in its recommendations from that of the committee. Mr. J. Traill Taylor thought the opticians of the continent and America had not been consulted and should be considered, and then Mr. T. S. Taylor, of Leicester, spoke at length in defense of the report of the committee, and eventually it was moved by Mr. Traill Taylor, and seconded by Mr. T. S. Taylor, and carried with only two dissentients: "That the report be referred back to the committee again for conference with the opticians and the Photographic Society of Great Britain."

* Screws thus marked are the established standards of the Photographic Society of Great Britain.

NEW METHOD OF PREPARING ENGRAVINGS FOR THE LANTERN.

BY W. BLOXHAM, M.A.

THERE are innumerable engravings to be found everywhere, and especially in the illustrated monthlies, that are so well adapted for converting into lantern slides that the wonder to me is, that they have not been utilized for this purpose long since, or that attention has not been more especially called to their fitness for such use being made of them. Having a series made for my own use from a source such as that mentioned, and having shown them to discriminating spectators with the most excellent effect, I am of the opinion that a few words on this subject will be of use to my fellow-readers of this journal.

I do not think that there is the slightest necessity for trying to pass off photographs of engravings for photographs from nature, for it is quite a mistaken idea for any one to cherish that photographic subjects are alone fitted for even a high-class lantern entertainment.

However, when the lines in the engraving to be copied are of a too obtrusive nature, it may be advisable to tone them down. This may be done in two ways, both of which I shall mention.

The first of these is to photograph the engraving in such a way as to break up the lines in some measure. The best system I have tried is to cover the engraving with a thin and rather finely ground glass, keeping the polished side of the glass down, the ground side being uppermost for a reason I will just give. It is of paramount importance that the glass be scrupulously clean and that no greasiness be present on the ground surface. An application of ammonia (followed by water), nitric acid, or even soapsuds will insure this necessary condition.

Now, having laid this plate down upon the engraving in the way I have prescribed, note that everything now has a pencilled effect, that the bold blackness of the engraving has given place to precisely the appearance as if the work had been executed by a graphite pencil. None of the lines are now visible as lines, but a delicate softness pervades every part. If a photograph were taken of the print in this state it would be too soft to be of much use. But to impart all the original vigor to the salient portions of the picture, it is only requisite that a brush charged with oil be passed over the ground glass, when it will acquire its pristine blackness.

As the weakest parts of many engravings are the skies and foregrounds—by “weakest” I mean here those parts in which the lines show with most marked prominence—such portions should not be oiled, or if so it should be very sparingly done. A calico rag is useful at this stage, as by rubbing with it, any part may have its strength subdued to any necessary or desired extent. When a negative is taken either of a wood or steel engraving that has been “faked” in the way described, and a transparency then made from such negative in the usual way, it is exceedingly difficult to discover when on the screen that the original may have been an ordinary wood-cut in the *Century* or in any of the illustrated papers.

The second way to which I have alluded, consists of photographing the engravings in the usual manner, but putting it a little out of focus when doing so. I have never found this quite satisfactory. Neither has it been satisfactory to have the transparencies quite sharp, and then put them a little out of

focus when throwing them on the screen. If a transparency of this kind must be shown, it is much better to have a special old-fashioned un-achromatic lens in the lantern, as it does not give absolute sharpness, no matter how carefully the attempt to focus is made. This is the better plan of the two, but still it is not eminently satisfactory, for, owing to the general use of achromatic lenses in lanterns, the public are now educated to expect the acme of sharpness in projected pictures; and they will not easily be satisfied with less.

Having now described the two ways by which engravings may be prepared for lantern exhibition, I say without any hesitation that the first system is so greatly superior to the second as to leave no room for comparison between them. The adoption of this method of preparing engravings instead of natural photographs for lantern work will open up a wide door of usefulness in the preparation of illustrations for lectures on travel, and indeed on any of the thousand and one topics which are treated in illustrated serials and books.

THE SIZES OF PHOTOGRAPHIC PLATES.

BY J. CRAIG ANNAN.

[A communication to the Glasgow Photographic Association.]

THE question whether the sizes of plates and papers at present adopted by British manufacturers are the most economical that could be devised, is a subject worthy of careful consideration.

How the present sizes came to be fixed I do not precisely know. The terms whole-plate, half-plate, and quarter-plate have the ring of a convention about them, and may have been fixed by some photographic parliament in days long gone by. Plates $8\frac{1}{2} \times 6\frac{1}{2}$ were the largest size prepared for Daguerreotypes, and probably were then known as full plates, and this may be the origin of the terms. Other sizes appear to have been designated by the makers of cameras in a haphazard way, as their fancy or expectancy of custom led them. What I wish to discuss to-night is, whether the proportions of length and breadth in the standard sizes of British plates are the most economical that could be devised? I think most certainly they are not, and I would like very much to see this subject taken up by the International Congress which is to meet this year in Brussels; for the double reason that an international series of sizes might be fixed, and that they should be arranged on some reasonable basis.

In a communication to this Society about five or six years ago, the late Mr. Norman Macbeth, R.S.A., laid down a rule to find the best proportions of length and breadth for a picture, the resulting proportions being $\sqrt{2}$ inches \times 1.

Now, while maintaining that the ultimate proportions of a print must depend entirely on the composition of the picture, I have become firmly convinced that this shape is the most useful and economical that could be found for general work.

Compare this size with those in use :

$\sqrt{2} \times 1 = 1.41 \times 1$	$8\frac{1}{2} \times 6\frac{1}{2} = 1.31 \times 1$
$15 \times 12 = 1.25 \times 1$	$7\frac{1}{2} \times 5 = 1.5 \times 1$
$12 \times 10 = 1.2 \times 1$	$6\frac{1}{2} \times 4\frac{3}{4} = 1.37 \times 1$
$10 \times 8 = 1.25 \times 1$	$6\frac{1}{2} \times 4\frac{1}{4} = 1.53 \times 1$

A glance at the list shows that nearly all the sizes are less oblong than the

Macbeth proportions, the modified half-plate $6\frac{1}{2} \times 4\frac{3}{4}$ being nearer it than any other. Consider for a moment, and I think you will find that in nine cases out of ten in trimming a print from a 15×12 , 12×10 , or even whole-plate negative, you have to cut more off the breadth than the length to make the shape look pleasant, and that a half-plate oftener than any other size is a suitable shape as it stands.

Compare this size also with the artists' canvasses which have the largest sale :

$$\begin{array}{ll} \sqrt{2} \times 1 = 1.41 \times 1 & 10 \times 7 = 1.43 \times 1 \\ 18 \times 12 = 1.5 \times 1 & 20 \times 16 = 1.25 \times 1 \\ 14 \times 10 = 1.4 \times 1 & 18 \times 14 = 1.28 \times 1 \\ 12 \times 8 = 1.5 \times 1 & \end{array}$$

These two last sizes are for portraits, head and shoulders, and are of course squarer than an average picture would be.

And now I wish to point out the most interesting and useful feature of this shape, which is that, when it is doubled, the relative proportions are precisely maintained. $1 : \sqrt{2} :: \sqrt{2} : 2$.

You will at once see the manifold advantages of a series of plates based on a principle such as this. And as this paper is not intended to go fully into the subject, but is written more for the purpose of raising a discussion on what I consider a most important matter, I will conclude by giving a list of sizes on the lines which I would like to see carried out. Of course if an international series were fixed, they would be worked out in the metric system :

$$\begin{array}{ll} 4\frac{1}{2} \times 3 & 12 \times 8\frac{1}{2} \\ 6 \times 4\frac{1}{2} & 17 \times 12 \\ 8\frac{1}{2} \times 6 & 24 \times 17 \end{array}$$

As the sizes become large, the difference between them is too great, and intermediate sizes would be required.

$$\begin{array}{ll} 7 \times 5 & 20 \times 14 \\ 10 \times 7 & 28 \times 20 \\ 14 \times 10 & \end{array}$$

THE JOINT ANNUAL EXHIBITION.

THE agreement heretofore existing between the New York, Philadelphia and Boston Societies to hold annual exhibitions under joint rules and a joint management, was cancelled in October, 1890, and a new agreement adopted whereby exhibitions are to be held in rotation annually in the respective cities, but under the exclusive management of the local society and under such regulations and rules as it may adopt. Medals or diplomas will be issued in the name of the society holding the exhibition.

The Board of Directors of the Society of Amateur Photographers in October, 1890, appointed a special Committee of Arrangements to select judges and manage the exhibition to be held in New York, May 25 to June 6, 1891, inclusive, and also adopted the following conditions and rules for the exhibition :

Conditions. — 1. Medals shall be awarded by a Board of Judges, consisting of three persons chosen by the Committee of Arrangements with special reference to their knowledge of artistic, technical and scientific photography. No other awards of any kind shall be made.

2. Medals shall be awarded only "for artistic, technical or scientific excellence." In making their selections the judges shall give due recognition to work in any of the various branches or processes of photography which may show unusual merit. The aid of experts may be called in when special information is necessary.

3. The entire number of awards is left to the discretion of the Board of Judges, dependent upon the amount of work of high merit exhibited, but shall not exceed twenty-five. Three of these shall be for excellence, one in each of the following classes :

- a. Lantern Slides (set of six, negative and positive, by exhibitor).
- b. Applied Photography—Scientific or Technical.
- c. Excellence in apparatus. Awards may be made for an entire exhibit, or for any part thereof.

The judges may specially designate any particular picture for which a medal is given.

4. All photographers are at liberty to compete, but the judges are instructed to give preference, other things being equal, to work done entirely by the exhibitor.

5. The members of the Board of Judges shall not compete for awards, nor be connected in any way with the management of the exhibition.

6. The decision of the Board of Judges shall be final.

Rules.—1. No picture which has once been exhibited in competition at a previous annual exhibition held under the auspices of the New York Society shall be again admitted for competition.

2. No picture will be received "for exhibition only," unless by special consent of the Committee of Arrangements.

3. No pictures which have taken prizes elsewhere shall be so designated until after the awards have been announced.

4. All pictures must be framed (with or without glass, at the option of the exhibitor). Pictures from foreign exhibitors should be sent by mail, unmounted. They will be mounted for exhibition by the Committee of Arrangements free of charge.

Foreign exhibitors, so desiring, can send their pictures framed, by express (prepaid).

5. The Committee of Arrangements shall have the right to reject the whole or portions of any exhibit offered ; and if, in order to fairly apportion the space at their disposal among the various exhibitors, it becomes desirable to leave any pictures unhung, the rejections shall be made at the option of the Committee.

6. Entries of all exhibits must be made in duplicate, on blanks issued by the Committee of Arrangements, giving, for catalogue purposes, etc., information on the following points :

- Number and size of frames.
- Amount of wall space required.
- Total number of pictures.
- Subject title of each.
- Lens and plate used for negative.
- If for sale.
- Price.
- Name, address and society of exhibitor.

7. The exhibitor's name and address, also a number corresponding to the descriptive number upon the entry form, shall be clearly written on the labels provided, which shall be attached to the back of each frame.

When two or more prints are mounted in one frame, a designating letter shall be placed under the center of each print, and all letters so placed shall appear in the entry form opposite the title of their respective pictures. Nothing else may appear in front of frame except title of picture and exhibitor's name.

8. No picture may be withdrawn before the close of the exhibition.

9. All pictures must be sent at owner's risk, prepaid and delivered to the Committee of Arrangements at the place by them indicated, and return charges collected by carrier.

10. The Committee will not be responsible for any loss or damage that may occur to exhibits while in its charge, but will use all reasonable care to prevent such occurrence; and at the close of the exhibition will repack each exhibit and ship as directed by the exhibitor.

11. Advertising in any form in connection with an exhibit is strictly prohibited.

12. A charge shall be made for wall space at the rate of twenty-five cents per square foot (the minimum charge being one dollar) to all except *foreign exhibitors* and members of the Photographic Society of Philadelphia, Boston Camera Club and the Society of Amateur Photographers of New York.

The amount of charge for wall space must be inclosed with entry form to the Committee of Arrangements.

If any of the pictures entered are not hung, a due proportion of the charges will be returned.

A commission of 10 per cent. on all sales will be retained.

13. Models of photographic apparatus must have a removable card attached, containing the name of the exhibitor and the number to which it refers on the entry form. The exhibitor should also fasten a small adhesive printed label to the exhibit containing his name only. Each exhibitor is required to write on the entry form supplied by the society a concise description of each piece of apparatus.

14. A charge of three (\$3) dollars will be made for each piece of apparatus entered by members of the Photographic Society of Philadelphia, the Boston Camera Club and the Society of Amateur Photographers of New York; non-members will pay five (\$5) dollars, which, in all cases, must be inclosed with the entry form, otherwise the apparatus will not be received.

15. Apparatus and appliances that have been shown at any previous exhibition, or those that do not embrace some points of special interest (to be mentioned by the exhibitor on the entry form) may be refused.

16. Lantern slides must not exceed $3\frac{1}{4}$ inches high, and the diagonal line of the mat opening must not exceed $3\frac{3}{4}$ inches in length. It is suggested that the title label be placed at the right hand end, and a thumb label on the lower left hand corner of the cover glass, as the picture is viewed in its natural position.

17. Lantern slides will only be eligible for competition and award when both the negatives and slides are the work of the exhibitor. Not less than six should be sent by any one exhibitor for competition. A list of the slides and particulars as to the process employed should be stated on the entry form.

SUGGESTIONS.—*Lantern Slides*.—Special endeavors will be made by the Com-

mittee of Arrangements for the competition and exhibition of slides by the oxyhydrogen lantern four times during each week of the exhibition. Optical lanterns, operated by gas or electric light, will be admitted for competition under the head of apparatus, and the exhibitors will be allowed to show their working during the exhibition, by and with the consent of the Committee of Arrangements.

Negatives.—Negatives and transparencies may be entered for exhibition, and should be suitably framed.

Photo Mechanical prints and photographs colored by scientific or mechanical means will be admitted for exhibition but not for competition, and should be limited in quantity.

Special Processes.—Any applicant submitting illustrations or specimens for exhibition, made by a special process, will be requested to furnish a description and particulars concerning the same.

Entry Forms.—Blank entry forms and blank labels to be placed on the back of frames will be furnished on application. See Rules 4, 6, 7 and 12.

RECEPTION OF EXHIBITS.—Foreign exhibits should reach New York by May 1, 1891, to allow ample time for mounting.

All exhibits (including pictures, negatives, transparencies, lantern slides, apparatus and appliances, etc.), must be delivered (carriage prepaid) on or before May 11, 1891, addressed to

Committee of Arrangements,
113 West 38th Street, New York, U. S. A.

CORRESPONDENCE.—All correspondence respecting the exhibition, blank entry forms and frame labels, should be addressed to

F. C. BEACH,
Chairman Committee of Arrangements,
113 West 38th Street, New York, U. S. A.

A LETTER ADDRESSED TO ALL DAGUERREOTYPISTS.

To the Editor of Anthony's BULLETIN :

As the old Daguerreotypists are fast passing away, one by one, it is the desire of the undersigned to get information from those still living which he considers of importance.

The announcement of Dr. Koch's alleged discovery for the cure of tuberculosis stirred the whole civilized world to a high degree of excitement, showing that anything on which a hope of cure for that scourge of humanity can be placed is received with the liveliest interest.

My experience leads me to believe that the vapors developed by the iodine, bromine and mercury in the dark room, as formerly used by Daguerreotypists, forming iodide and bromide of mercury in a nascent state, together with the uncombined vapors of the iodine and bromine, proved curative in incipient consumption. This method of cure can be rationally based upon the destructive influence on the tuberculous bacteria by the above agents.

I now call upon all the old Daguerreotypists who have any experience or knowledge in this direction, or any facts, favorable or otherwise, to communicate with

C. L. LOCHMAN,
Bethlehem, Pa.

THE DAGUERRE FUND.

SUBSCRIPTIONS ARE STILL IN ORDER.

THE following is a partial list of the contributions to the Daguerre monument as far as we have received notice of them up to this date. We shall take pleasure in adding to this list as the names are sent to us. These are in addition to the money raised by dollar subscriptions :

Dr. A. H. Elliott, \$25 ; G. Cramer, \$500 ; E. & H. T. Anthony & Co., \$500 ; W. V. Ranger, \$10 ; W. G. Entekin, \$100 ; C. H. Codman & Co., \$100 ; Benjamin French & Co., \$100 ; G. Gennert, \$50 ; Rhinehart (City of Denver), \$50 ; Sheen & Simpkinson, \$25 ; D. P. Thompson, \$25 ; L. W. Seavey, \$25 ; Hetherington & Coover, \$25 ; *St. Louis and Canadian Photographer*, \$25 ; S. J. Dixon, \$25 ; G. D. Milburn, \$25 ; Brodie Mfg. Co., \$25 ; John W. Morrison, \$25 ; D. R. Coover, \$25 ; Fowler & Slater, \$25 ; Catherine Weed Barnes, \$20 ; S. L. Stein, \$20 ; L. C. Overpeck, \$10 ; L. J. Ullman, \$10 ; Mr. A. J. Riddle, \$10 ; *Photographic Herald*, \$10 ; Ph. Bonte, \$10 ; J. R. Pearson, \$10 ; Baker's Art Gallery, \$10 ; F. E. Hastings, \$10 ; Buffalo Argentic Paper Co., \$10 ; J. G. Edgeworth, \$10 ; E. M. Estabrooke, \$10 ; Loney & Gable, \$10 ; E. J. Pullman, \$10 ; G. H. Van Norman, \$5 ; W. Stuber, \$5 ; E. Stanton, \$5 ; J. M. Brainerd, \$5 ; E. Fieger, \$5 ; A. W. Judd, \$5 ; Eddy Bros., \$3 ; G. L. Hurd, \$2 ; T. M. Mackey, \$1 ; J. R. Clemons, \$1 ; Bausch & Lomb Optical Co., \$20 ; J. M. Appleton, \$25 ; M. A. Seed Dry Co., \$100 ; R. H. Moran, \$25 ; Geo. Murphy, \$20 ; F. W. Guerin, \$10 ; Arthur, \$10 ; C. Gentile, \$10 ; C. W. Motes, \$10 ; Benjamin Brothers, \$5 ; Elrobora, \$5 ; E. Decker, \$5 ; S. B. Brown, \$5 ; Eugene Smith, \$5 ; F. Plotser & Co., \$5 ; M. G. O., \$2 ; Geo. Sperry, \$2 ; Adam Heimberger, \$2 ; Charles E. Craven, \$2 ; J. E. Smith, \$2 ; J. C. Fitzgerald, \$2 ; W. E. Eusten, \$2 ; W. Noel, \$1 ; L. M. Jackson, \$1 ; S. F. Sloan, \$1 ; A. M. Wiggins, \$1 ; J. W. Vance, \$1 ; A. M. Collins Mfg. Co., \$100 ; John Carbutt, \$100 ; M. Carey Lea, \$10 ; *The Photographic Times*, \$100 ; "Kicker," \$5 ; *The American Amateur Photographer*, \$20.

OUR ILLUSTRATION.

OWING to difficulties in getting the large number of silver prints necessary to illustrate the BULLETIN, we are compelled to give our subscribers a photogravure frontispiece with this issue, rather than delay the issue of the journal to secure the balance of the prints necessary. We therefore present our subscribers with a fine view of the Cordilleras in South America, taken from a handsome aristotype print made by our good friend, Mr. C. Stachow, of Chili. With the next issue of the journal we shall give the silver print that should have been presented at this time. The negatives from which Mr. Stachow's prints were produced were made with a cheap outfit and a single landscape lens. They show what skill can do with indifferent apparatus.

THE BULLETIN FOR 1891.

THE BULLETIN has gradually but steadily worked its way upwards in the ranks of American photographic literature until now it is second to none in the quality and quantity of material that it presents to its readers. The testimony of its ever-increasing subscription list is the best evidence that its course is appre-

ciated by photographers. Its aim has always been for the advancement of photography in all its phases. It has advocated and nursed the best interests of the professional as well as offering every encouragement to the amateur.

Looking back over the past year the BULLETIN has been foremost in placing before American photographers the latest developments of the art. The eikogen developer was noticed in its pages, and its character described long before other journals even thought of its great value. Acid-sulphite was announced and its uses made practical to photographers in the United States for the first time in this journal. The results of the Congress of Photographers in Paris was also noticed in this journal immediately on receipt of the reports on this side. The method for the reversal of the image by thio-carbamides was first seen by American readers in these pages. Primuline, the new printing material, also received the earliest extended notice in the pages of the BULLETIN. Our facilities for obtaining news from Europe and bringing it before our readers are not equaled by any other American photographic journal.

The contributors of original articles to the pages of the BULLETIN are in the first rank of both American and foreign photographic workers. There is not a name among them but tells of either high scientific or advanced practical ability.

In the matter of translations no other American journal attempts to reproduce from German and other sources the advanced class of articles on photographic subjects that have appeared in these pages. Many of these are reproduced in English photographic journals, and not always with an acknowledgment of the source whence they obtained them.

As usual our reports of societies are as full and as accurate as possible: in a great many cases fuller and more accurate than those of our contemporaries who ask more from their subscribers.

Our correspondence department is always an important feature of the journal, and its popularity remains as great as ever. We have never printed a question that has not come from a *bona fide* inquirer; although there are journals where such queries are concocted in the office of the editor.

We are led to speak loudly in praise of what has been accomplished by the BULLETIN, because we are satisfied that the Editors and their staff have done everything in their power to make the journal the best in the United States. Every effort of theirs has been willingly seconded by us, and every dollar received as subscriptions has been expended in the interests of the journal. This being the case, it follows that the greater the number of our subscribers, the better we can make the journal. As the BULLETIN is not issued to pay dividends, but to encourage the art of photography, and as our facilities for the collection of photographic information are unsurpassed, we claim we can give our readers more good material for their money than they can obtain in any other manner. Therefore every subscriber has a personal interest in the work, and the greater the number of subscribers the better the results must be. Send your subscription early and help the good work along. Subscribe to the journal that has the largest circulation in the United States, and is therefore doing the greatest good to the greatest number.

E. & H. T. ANTHONY & Co.,

Publishers.

I HAVE learned to take great pleasure in the visits of the BULLETIN.

J. T. BARNES.

ANTHONY'S Photographic Bulletin.

EDITED BY

Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.C.S.,
and a corps of practical assistants.

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EVERY ISSUE ILLUSTRATED.

→ SUBSCRIPTION → RATES ←

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" Foreign Countries, 3.75
Edition without illustrations, \$1.00 less per annum.

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Remit by Express Money Order, Draft, P. O. Order, or Registered Letter.

Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

THE AMATEUR PHOTOGRAPHIC SOCIETY OF BALTIMORE.

THE regular meeting of the Society was held at the rooms on Friday, November 21st, the President, ISAAC T. NORRIS, in the chair, and thirteen members present. The proceedings of the last meeting were read and approved.

The application of William LaRoux for membership was read and referred to the Executive Committee for approval, and the resignations of Rheinhold H. Richner and Miss Madeline Le Moine were, on motion, duly accepted, for reasons as stated in their notes of resignation.

The Committee on Lantern Slides reported that they had made about one hundred, and expected to have fully thirty more within the course of about two weeks, and action could then be taken as to our next exhibition, as with one hundred and fifty assured, there would be no trouble to make the requisite number needed, viz.: one hundred and fifty. The Committee on "Illustrated Baltimore" reported that progress was being made and that they now had in hand a number of fine

negatives on which they would soon start to make slides.

Quite a long discussion was entered into regarding a series of lectures to take place during the winter on subjects photographic, for the entertainment and improvement of our membership, and several very eminent persons were mentioned who would favor the Society with lectures, amongst others, Professors Rowland, Wilson and Smith, Dr. Onderdonk and Howard Jefferson, the latter on Photo-Mechanical processes. These lectures, together with such slides as had been engaged, it was the sense of the meeting would fill up the place of the slides of the Interchange, which it was decided to dispense with this season, owing to the fact that our Society was not ready to hand in to the Interchange a sufficient number of slides, and also owing to the fact that, from a monetary view, it was not deemed advisable to join the Interchange this season.

The Corresponding Secretary reported that "Illustrated California" had been engaged for exhibition during April, and also reported that he was in receipt of the *Photographic Globe*, Anthony's *Photographic BULLETIN*, *The Photographer*, *The Photographic Times*, *The Boston Photographic Review*, and the *Practical Photographer*, all of which were on the table for the use of the members. He also reported that the members of our society were cordially invited to an exhibition by the New York Club of photo-mechanical processes, and that the catalogue was on the table, but unfortunately the invitation came too late to be read at the meeting and allow the members to attend the exhibition.

Thanks were tendered Messrs. E. & H. T. Anthony for a number of samples of their new hydroquinone, which was distributed among the members for a test.

Attention was called by the President to our new dark room, which he stated, by the untiring efforts of Mr. James S. Cummins, was made equal to, if not superior, to that of any other amateur dark room in the country.

H. D. WILLIAR,

Secretary.

I GET so much good from the BULLETIN I would be lost without it. D. H. ATKINS.

I FIND it very instructive and could not do without it. W. S. EVANS.

ANTHONY'S PHOTOGRAPHIC BULLETIN of New York is one of the best of its kind. — *Richfield News*.

Brought forward.....	\$3,220 48
Balance to new account :	
In Illinois Savings and Trust Company, Chicago, at 4 per cent.....	\$2,013 20
In Central National Bank, Washington, D. C.....	315 52
	<u>2,328 72</u>
	<u>\$5,549 20</u>

D. R. COOVER, *in account* with the PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

Dr.

1890.	FOR SPACE.	
Aug. 15.	Received from A. M. Collins & Company.....	\$50 00
"	B. French & Company.....	30 00
"	E. & H. T. Anthony & Company.....	100 00
"	M. A. Seed Dry Plate Company.....	100 00
"	W. G. Entekin.....	35 00
"	Blair Camera Company.....	75 00
"	C. Quarterly.....	5 50
"	L. J. Ulman & Company.....	15 00
"	J. A. Bonine.....	15 00
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"	Buchanan, Bromley & Company.....	50 00
"	J. W. Bryant.....	100 00
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"	Louden & Kent.....	3 00
"	Acme Burnisher Company.....	30 00
"	Packard Brothers.....	70 00
"	Sheen & Simpkinson.....	29 90
"	Ed. Wuestner.....	70 00
"	W. G. Entekin, ad. in Souvenir, 1889.....	10 00
"	Williams, Brown & Earl.....	12 00
"	Theo. Endean.....	10 00
"	Smith & Pattison.....	12 00
"	Eastman Company.....	15 00
"	L. Walkup.....	20 00
"	J. Rosenthal & Company.....	25 00
"	L. W. Seavey & Company.....	60 00
"	U. S. Supply Company.....	50 00
"	Hetherington & Coover.....	100 00
"	J. A. Wallace, "Standard,".....	35 00
"	J. A. Knorr.....	35 00
"	G. Cramer.....	105 00
"	Bausch & Lomb Opt. Company.....	30 00
"	Wilson, Hood & Company.....	30 00
"	Otis C. White.....	30 00
"	E. J. Pulman.....	35 00
"	Allen & Rowell.....	35 00
		<u>\$1,465 40</u>

Cr.

Aug. 16.	Paid Treasurer.....	\$966 20
31.	" ".....	120 00
Sept. 16.	" ".....	127 00
Oct. 9.	" ".....	129 90
28.	" ".....	122 30
		<u>\$1,465 40</u>

THE PHOTOGRAPHIC SOCIETY OF JAPAN.

A MEETING of the above-mentioned Society was held on Saturday, October 11th, at the rooms of the Geographical Society, Tokio.

There was an exhibition of work done by members during the holidays, from noon onwards. There was a pretty fair collection of pictures, but it is to be regretted that more members were not represented. Probably the fact that only some seven or eight exhibited is due to the very unfavorable weather that there has been during nearly the whole of the summer.

Mr. Kajima Sebi showed a number of remarkably fine flower studies, and some colored prints on "aristotype" paper.

Mr. C. D. West had a set of prints, of which two, the steamship *Omaha*, taken from the yacht *Daimyo* while both vessels were in motion, were remarkable.

Mr. J. B. Rentiers and Mr. A. J. Hare each showed a set of fine landscapes.

Mr. W. K. Burton had a number of pictures of children bathing, taken at Misaki. Some of these were printed both in the ordinary way and on drawing paper with platinum toning, and were also enlarged on bromide paper, so that there was an opportunity of comparing notes of the effects of different processes.

Captain W. H. Hardy showed a print of a lifeboat, which attracted attention on account of its representing all that was left of the steamship *Musashi Maru*, after the late lamentable accident.

Mr. S. Oyama brought a very fine collection of copper-plate engravings and of photo-engravings.

There was on show the apparatus with which certain Professors of the University had made attempts, more or less successful, at deep-sea photography during the summer holidays, and which had resulted eventually in an explosion chronicled in this journal about a couple of months ago.

At 8 P.M. there was a short business meeting, at which the following gentlemen were elected: Mr. W. Mann, Mr. S. Oyama, and Mr. H. A. C. Boner. After this the meeting resolved itself into a conversazione.

ing the receipt of various photographic publications, the reports of committees were taken.

Mr. Newton exhibited several prints on aristotype paper, the toning solution consisting simply of hyposulphite of soda, alum and water. This bath both tones and fixes the prints and excellent results were shown. On aristotype paper, the speaker said, he had been able to reproduce the delicate detail of his negatives with far greater precision and fidelity than on albumen paper.

Mr. Fisk exhibited a curtain slide shutter, a portable candle dark-room lantern, and a magazine camera. The shutter in this latter was after the form of the drop shutter, and speed was attained by means of a rubber band. The greatest speed was estimated at the one hundred and eightieth part of a second.

Mr. Mason exhibited a photometer of his own design. He had worked on the principle that, in order to determine the necessary exposure, the measurement must be made of the intensity of the light proceeding from the object to be photographed. The instrument is pointed at the object; a disk carrying translucent films of various degrees of density is rotated until letters on these films are just visible. Then by rotating a series of rings, referring to the kind of plate, lens aperture and the like, one may read off the time of exposure.

A very interesting series of views loaned by members of the Camera Club, Mr. Newton and other members of the section, were shown on the screen, the lanterns being ably managed by Mr. A. D. Fisk, to whom a hearty vote of thanks was extended at the close of the meeting.

It was announced that at the meeting in February next Professor Elmendorf would give an account of his travels in Holland illustrated with lantern slide views.

I HAVE been highly pleased with the
BULLETIN. J. Z. SALTER.

I HAVE found so much to instruct and entertain me during the past year.

C. B. TALBOT.

AMERICAN INSTITUTE—PHOTOGRAPHIC SECTION.

THE monthly meeting of the above section was held on December 2d, President HENRY J. NEWTON in the chair. After acknowledg-

ing the receipt of the BULLETIN for ten dollars a month. We think it the best reading matter we ever saw, and every live photographer should have it.

CRABTREE BROS.

Bibliography.

HANDBUCH DER PHOTOGRAPHIE, von Prof. Dr. H. W. Vogel. Theil I. Berlin: Verlag von Robert Oppenheim, 1890.

This is the fourth edition of one of the best handbooks of photography yet published. The present volume covers only the subjects of photochemistry and the descriptions of photographic chemicals. This is done in an extremely complete manner and with a wealth of illustration not usually found in works of this character. Beginning with the physical action of light, the author then considers the chemical action of light upon both inorganic and organic substances, together with the action of light upon vegetable and animal life. Taking up the individual metals and their compounds, the author gives a most complete exposition of the action of light upon those specially interesting to the photographer. Finally a series of interesting descriptions of photographic chemicals, developers, reducers, sensitizers, etc., are given, crowding the volume with a large amount of most valuable material of both practical and scientific interest. The volume is a large octavo of about 350 pages, finely printed, beautifully illustrated with 13 plates and a number of woodcuts.

ANFÜHRliches HANDBUCH DER PHOTOGRAPHIE, von Dr. Josef Maria Eder. Halle a. S. Wilhelm Knapp's Verlag, 1890. Erste und Zweite Lieferung.

This is another of those carefully written German handbooks of photography appearing in a new edition. Written by an author in the first rank in photography, it is arranged from a thoroughly practical standpoint and with every detail carefully considered and explained. The prospectus published with the first part covers the entire field of photography, and the finished work will be a veritable encyclopedia upon photography. The first parts treat of the history of photography from ancient times until the time of Daguerre in 1839. The work is to appear in forty parts, of which two are out.

TRAITE DE LA PHOTOGRAPHIE AU MAGNESIUM, du Dr. Eder. Paris: Henry Gauthier-Villars.

This is a French edition of the excellent German volume of Dr. Eder on "Magnesium Flash Light Photography." Those of our readers who can read French will find this little volume very interesting.

IN SCRIPTURE LANDS. New Views of Sacred Places. By Edward L. Wilson, Ph.D. New York: Charles Scribner & Sons.

This is a fine volume containing about 150 illustrations engraved from Dr. Wilson's own photographs of sacred places. The contents embrace:

"The Land of Goshen," "Sinai and the Wilderness," "From Mount Sinai to Mount Seir," "A Visit to Petra," "A Search for Kadesh," "Three Jewish Kings," "The South Country," "Round About Jerusalem," "Where was Calvary," "Judea to Samaria," "Round About Galilee," "Nazareth Old and New," "Sea of Galilee," "Lebanon to Damascus."

Dr. Wilson's journey in Scripture lands was the first instance in which a fully-equipped artist-photographer has visited the scenes made memorable by the Bible narratives, and has reproduced, both by camera and by word-painting, the people, the ruins, and the famous spots which have become household words throughout Christendom. The 150 illustrations in this volume were selected from 2,000 negatives that Dr. Wilson brought home with him after his wanderings, and they have been reproduced by some of the best known of American artists. Together, they make a gallery of absolutely accurate, graphic, and extremely interesting views. The narrative, moreover, is enlivened with the account of the author's personal adventures, and is the work of a man whose study of the Scriptures is apparent throughout.

We are sure that every Sunday-school library should have this volume, and every clergyman and Sunday-school teacher will find it a delightful and desirable companion. It is beautifully printed on fine paper and would make a handsome Christmas present.

THE DEVELOPMENT OF GELATINE DRY PLATES. By Rev. W. H. Burbank. Brunswick, Maine.

This, a very complete little volume on photographic work, intended for beginners, shows a large amount of patient labor on the part of the author, and must prove serviceable to those who make a study of development. It is a small volume of about 90 pages and is well printed.

THE ART OF MAKING PORTRAITS IN CRAYON ON SOLAR ENLARGEMENTS. By E. Long. Quincy, Illinois.

The third enlarged and re-written edition of this exceedingly practical little volume is

before us. Mr. Long has made the subject whereof he speaks entirely his own, and no mistake can be made in following his guidance. The book is terse, clear, and thoroughly practical, and we recommend it to all working upon solar enlargements.

LANTERN SLIDES BY PHOTOGRAPHIC METHODS. By Andrew Pringle. New York: Scovill & Adams Company.

Mr. Pringle has for some years made a specialty of lantern work, and the volume before us embraces a number of his experiences. Wet and dry collodion processes, together with the gelatine dry plate methods, are given, together with methods of coloring slides, masking, mounting, etc. It is very practical and full of profitable information. It is a large octavo of about 70 pages.

PLATINUM TONING. By Lyonel Clark.—EXPERIMENTAL PHOTOGRAPHY. By C. J. Leaper, F.C.S.—ART PHOTOGRAPHY. By H. P. Robinson.—CAMERAS, LENSES, SHUTTERS, ETC.—Competitive Papers. New York: E. & H. T. Anthony & Co.

These are four handy little volumes issued by our publishers, and they contain the cream of information upon the subjects of which they treat. The names of the authors are a sufficient guarantee of the excellence of the volumes to which their names are attached. Those who wish to keep up with the times should certainly get these little manuals and study them. They are worth more than is asked for them.

VESPER BELLS AND OTHER POEMS. By W. T. Mersereau; Illustrated by George R. Halm.

It is a beautiful volume of original work, containing a number of selections which may better than anything else be termed poetic sketches. The poems are full of sentiment, and while they would bear more careful versification they yet stand out in strong relief as sketches, and are well worth reading. One of the features of the work is the fact that it is not only beautifully illustrated throughout, but that the entire text of the book is drawn and in many cases interwoven with the illustrations, and all printed from photo-mechanical plates made direct from the artist's work.

Many of the plates are most dainty in execution and the entire book is a pleasure.

The book is printed on paper $9\frac{1}{2} \times 12$, enclosed in handsome covers, and the edition limited to 200 copies.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—D. H. H., writes: Would you please give in the BULLETIN an estimate of how many incandescent electric lights, distributed in the same position as a skylight, would give equal actinic power to ordinary bright daylight for photographic studio use?

A.—If the lamps were placed as close as possible together, it is doubtful if you could get a result of equal actinic effect to daylight. But very good results could be obtained with sufficient lamps to give 1,000 candle-power, say forty lamps of 25 candle-power each, or a corresponding number of still smaller lamps. The larger the number of lamps the better distribution of light is obtainable.

Q.—T. L. J., writes: I inclose a piece of paper which was floated on a 50-grain bath one and a half minutes and fumed half an hour. You see it is all covered with black spots on the back. One whole sheet in the lot I silvered this morning was just that way. It seemed worse through the center, and the spots appear more or less on all paper I have floated for two months, and I have had to throw away nearly half of it. Will you please tell me through the BULLETIN the cause of these spots. I have heard that another photographer here complains of the same thing. He thought it was in the paper. I would also like to know what the white substance is that comes to the top of the paper bath when c. p. muriatic acid is added? It looks just the same as when camphor is added. Will either or both ways free the bath of albumen?

A.—The spots are probably due to some organic dust that has fallen upon the paper when lying in the printing room. A little dampness has caused them to penetrate the back of the paper, and therefore they show on the face. The dust from the floor, pyro particles, even the dust carried through the cracks of a window would do this. Keep the paper very carefully covered, and we think you will have no further trouble. It is best to keep it in a tight box with felt around the edges of the cover to exclude dust, if you are located in a dusty position. Other answer next issue.

Q.—C. S. S. writes: I wish you would state in "What Our Friends Would Like to Know," 1st, How much duty there is on albumen paper, and how much more is it than the old jaw; also, how much it affects other articles we have to use in a common gallery? We have an idea the stock houses are making more out of the tariff than there really is. If you will give us a list of the articles we use, it will enlighten a great many of the photographers and help them to meet the stock house excuses for the extra high prices we have to pay.

A.—Your question about albumen paper was very well answered in the last number of the BULLETIN in the articles on "Albumen Paper and the Tariff." The increase of duty on albumen paper is 20 per cent. Formerly the duty was 15 per cent., now it is 35 per cent. In regard to other duties we cannot spare space here to give you a list; but write to the *New York Journal of Commerce* and send five cents in stamps, asking them to mail you the "Tariff Edition" of the journal. This will give you all the information you desire.

Q.—S. T. McK. writes: I have a number of "American films" (Eastman's paper negatives) developed last spring and mislaid before they could be stripped. Now they refuse to come off the paper with ordinary treatment. Can any one suggest a remedy?

A.—We have encountered the difficulty that you speak of. It is caused by the action of the emulsion upon the soluble gelatine with which the paper is first coated. This soluble coat, by contact with the emulsion, gradually becomes insoluble, and it is next to impossible to remove it from the paper. Perhaps soaking in a 2 per cent. bath of glycerine for some hours may help the stripping, if the latter is made with very hot water; but this is only effective in a few cases.

Views Caught with the Drop Shutter.

MESSRS. BARKER & STARBIRD, of Bromfield street, Boston, have samples of the photographs in color made by Veresz, of Austria, and will be pleased to exhibit them to all who are interested and will give them a call.

B. F. POLLARD, of Dover, Me., has just issued a charming little album of views of Dover and Foxcroft. They are neatly produced and form a handsome souvenir of the localities. Those interested should obtain copies of them.

ANOTHER NEW DRY PLATE COMPANY. The Hammer-Althans Manufacturing Company, with a capital of \$120,000, have organized in St. Louis to manufacture dry plates. Mr. Hammer was President of the St. Louis Dry Plate Company and Mr. Althans was formerly with the G. Cramer Company. We understand that the new company will be under the best scientific and chemical supervision.

SWEET WALLACH & COMPANY, of Chicago, have bought the photographic supplies of Messrs. Smith & Pattison of that city. Mr. Pattison goes to Messrs. Sweet Wallach, and Mr. Smith engages in making photographic specialties under the name of J. H. Smith & Co., at 261 State street of the same city.

GAYTON A. DOUGLASS & Co., of Chicago, have made an assignment.

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FROM NEGATIVES MADE ON

ANTHONY'S CLIMAX NEGATIVE FILMS.

ANTHONY'S Photographic Bulletin.

Prof. CHARLES F. CHANDLER, Ph.D., LL.D.

Prof. ARTHUR H. ELLIOTT, Ph.D., F.C.S.

DECEMBER 27, 1890.

Vol. XXI.—No. 24.

WHITHER ARE WE DRIFTING?

THE student of the advances of modern photography is bewildered at the tendency of the times in the matter of photographic chemistry. With the advent of the modern dry plate in 1878, scarcely twelve years ago, the few developing agents used gave a marked simplicity to the manipulations called for from the photographer. To expose, to develop with ferrous sulphate and oxalate of potash, to fix in the time-honored hypo bath, was all that appeared necessary. Occasionally one heard of the use of pyrogallol and soda crystals; but these gave no particular trouble, and their action was so simple that every tyro could use them without let or hinderance. Presently certain preservatives of the pyro were introduced—inorganic bodies, such as sodium sulphite, or organic bodies, like salicylic acid, proving useful and effective. Nevertheless these did not complicate matters very much, and the professional and amateur went serenely on, making pictures and spoiling plates in the simplest possible manner.

Presently a new era began to dawn and the educated chemist took a more active part in photographic manipulation. He took up the study of development and sought to introduce new reducing agents to bring out the latent image on sensitive and exposed films. Hydroxylamine, although formerly used by a few of the more advanced workers, was again brought forward and the conditions of its action more carefully studied. Another set of workers took up hydroquinone or quinol, and its special functions for photographic work were well investigated and made permanently useful even till to-day. Then came the latest candidate for favor, eikonogen.

Up to this time the various organic developing agents were members of a class of bodies that the chemist calls hydroxyl compounds, *i. e.*, they all contained the peculiar combination of oxygen and hydrogen (—O H) which is known by the name of hydroxyl. In pyrogallol there are three groups of this couple; in hydroxylamine we find only one such group; in hydroquinone we have two. Pyrocatechin, another developing agent belonging to this same class, also contains two groups of hydroxyl. But in eikonogen we enter a new field of organic bodies capable of acting on the latent photographic image. These contain, besides hydroxyl, a group containing nitrogen and hydrogen called amidogen (N H_2), which is even more forcible in its action than the hydroxyl, especially when united with it. Eikonogen, or amido-beta-naphthol-beta sulphate of sodium, as the chemist calls it, is only one of a large class of bodies called amido-phenols, compounds containing both the hydroxyl and amidogen groups possessing reducing qualities. To this same class belong at least ten

other bodies of a similar structure, and all known to have powerful reducing properties.

Leaving developers and looking in the direction of orthochromatic plates we note that such substances as eosine, erythrosin, cyanine, rhodamine and a number of other organic dye stuffs are used to sensitize the photographic film for certain light rays to which it is slow to respond. Here again we note the peculiar character of the bodies used. Eosine is a beautiful dye stuff used to give certain shades of rosy hue to fabrics. It was called eosine from the resemblance of its shades of color to those of the early sunrise. Chemically it is called the alkaline salt of tetrabromfluorescein. Erythrosin is the corresponding iodine compound and is called the alkaline salt of tetraiodofluorescein. Both these substances are highly fluorescent, *i. e.*, they have the power of altering the character of the light rays and thus changing their effect upon the sensitive plate. By mixing these bodies with the silver bromide emulsion, or by bathing the ordinary silver bromide plates in solutions of these compounds, they become sensitive to yellow and orange light rays. Rhodamine and cyanin have similar actions, extending the activity of the light to the red rays. All these bodies belong to the organic compounds of the chemist and are especially related to the aromatic group.

Yet another interesting development of modern photographic research comes from the experiments of Colonel Waterhouse in the reversal of the photographic image by thio-carbamides, or sulphur-ureas—another class of organic bodies related to urea and containing a peculiar combination of sulphur.

Last, but not least, of these modern developments of photography in the domain of organic chemistry, comes the coloring-matter diazo-primuline, a light sensitive organic body also containing sulphur, which is more sensitive than silver chloride.

What then is the tendency of modern photographic research? Clearly into the region of organic chemistry; and although we are now only on the outskirts of the territory, there is no doubt that before the close of this century a revolution of photographic methods will result and be far more important than any yet seen in the art. When we consider the few minds, comparatively, that are engaged in this line of work, and also when we remember the prolific results that have come from similar researches in the production of coloring-matters for the dyer, we are compelled to believe in great achievements in the near future. When the first few lines of attack are fairly established an earnest band of chemical workers will enter the field and results similar to the brilliant series of productions from coal tar will astonish the photographic world. The drift of modern photographic research then is into the field of organic chemistry, and the study of the action of the sunbeam upon organic compounds will give to our art results more brilliant and enchanting than anything hitherto achieved. May we live to see some of these conquests in the region of the unknown, but by no means unknowable.

LONG may the BULLETIN live and prosper.

P. ERSLY.

THE BULLETIN is a great help to me and I could not get along without it very long.

MARIE H. KENDALL.

EDITORIAL NOTES.

By the aid of photography it has lately been suggested that Vega, one of the brightest stars of the northern heavens, is in reality a double star, composed of two suns, each revolving around a point midway between themselves but separated by a space of five millions of miles. Each of the twin stars is made up of matter about eleven times the bulk of our own sun. These facts have been demonstrated by Mr. Fowler in experiments in photographing the spectrum of Vega, and are certainly of great interest.

THE recent conference of amateur photographers, held in New York, proved a brilliant success, and resulted in the formation of an organization which will doubtless prove of great value to the promotion of photography in this country. A large number of the leading camera clubs and amateur societies were represented, and New York City was chosen as the next place of meeting, to be held on the third Tuesday of April, 1891, and to last over three days. The name of the American Photographic Conference was adopted, and the following officers elected for the ensuing year: President, Dr. Ely Van de Warker, of Syracuse; Vice-Presidents, George Bullock, of Cincinnati, O., and Dr. George L. Parmele, of Hartford, Conn.; Treasurer, W. H. Drew, of Boston; Secretary, T. J. Burton. Including the above, the following gentlemen were selected for the council: R. Dickinson Jewett, of Washington, D. C.; F. C. Beach, of New York; Professor Randall Spaulding, of Montclair, N. J.; Henry S. Fowler, of Brooklyn; Professor Edward Weston, of Newark; John V. L. Pruyne, of Albany; Robert S. Redfield, of Philadelphia; Cornelius Van Brunt, of New York; A. J. Thomas, of Hoboken; and J. W. Alexander, of Yonkers.

THE Hoboken Camera Club enjoyed at its exhibition last month a most delightful evening, and presented to its friends a charming collection of work by its members during the summer. At the close of the evening the judges and members of the club partook of a repast, and listened to music and speeches until a late hour.

AND yet another new developer has appeared, which is called cristallos, and which has been described by Dr. Julius Hoffmann as having a basis of cocaine, and as being of marvelous energy. It is, in fact, the most powerful of all known agents. It gradually loses strength with use; and while with extremely short exposures and in greatly reduced proportions the fresh developer is often too vigorous, it may be easily governed by using the older solutions to start with, and increasing the quantity of fresh as required. It is said to be of three times the strength of pyro.

THE St. Louis Camera Club reorganized last month, and re-elected the former President, Secretary and Treasurer. A new constitution was adopted and a series of class demonstrations undertaken, with a view to instructing members in the manipulation of photographic work from the simplest to the most intricate. The camera house is to be handsomely decorated, and altogether the affairs of the club seem to be in a flourishing condition.

THE annual election of officers of the Albany Camera Club occurred in November, and resulted in the re-election of the old officers: President, W. W. Byington ; Secretary and Treasurer, Charles L. Palmer. New quarters are to be obtained at once, which will be large, tasteful and will contain all the latest conveniences. The club was never in a more healthy condition, and the coming season promises to be most successful.

WE repeat a few simple methods of dulling the highly polished reflecting surfaces of silverware, etc., which recently appeared in print, thinking that they may be of value to some. One writer advises allowing steam from the kettle to play on the bright, cold silver, thus forming a deposit of condensed moisture which kills reflection ; another obtains the same results by placing ice water in the vase or article to be photographed, while another dusts the article with whitening. A fourth uses fine wheat flour thrown down near the object, the dust from which settles upon it, while still a fifth says wipe the article with a clean oiled cloth.

As we have noted on former occasions, the price of metallic platinum is still rapidly advancing and likely to go still higher. The principal source of this metal are mines located in the Ural Mountains, which have been worked by the Russian government for more than sixty years. It is supposed to exist in large quantities in Eastern Russia, where, owing to its increased price, new mines will probably soon be opened.

WE are glad to note that experiments are being rapidly carried on with a view to developing the primuline printing process, and that the results, while they are very promising, cannot be said to be good as yet. There are lots of opportunity for the ambitious photographer to experiment in this direction, and sufficient probability of success to give him an incentive to work. We hope to record further work before long from some of our American co-laborers.

WE are in receipt, from Mr. Francisco T. Valiente, of San José, Costa Rica, C. A., of a collection of groups and single portraits made by himself, which show a great deal of good work in posing, grouping and arrangement of accessories, the latter being most noticeable in several groups arranged to represent action on shipboard. The backgrounds and accessories in these are very skillfully handled, and show that Mr. Valiente is not only an artist of great energy and perseverance but of good taste as well.

THE following is a list of officers of the Kansas City Camera Club : President, G. W. Pearson ; Vice-President, Fred. Mullett ; Secretary, C. A. Young, and Treasurer, William Perrine. Its meetings are held regularly every two weeks, and much interest manifested in its work.

THE Photographic Society of Philadelphia has lately instituted some changes in its form of government which would seem to be very wise ones. It has created a board of managers who regulate many of the matters of detail which always take up so much of the time of an organization of such a nature, and

has also changed the date for election of officers from January to April, which brings the entire winter's work of the society under the control of one set of officers, instead of necessitating a change of government in the midst of the busy working season.

A MEETING of the International Committee of the Photographic Chart of the Heavens is announced to be held in Paris, on March 31, 1891, at which time details will be discussed and immediate measures taken by all the observatories that are to take part in the work for actively engaging in the great task. And in this connection we note the largest picture of any nebula ever taken has lately been made at the Algiers Observatory, the time of exposure being six hours. The object photographed was the ring nebula in Lyra, and the enlargement was sixty-four times the size of the original negative. Three very feeble stars which have heretofore never been discovered were seen inside the ring, the whole interior of which is shown to contain matter which is scarcely discernable through the most powerful telescope, but which is apparent on the sensitive plate.

WE learn that Professor Heilprin, of Philadelphia, has achieved the feat of photographing the crater on the top of Mount Orizabo, Mexico, which is 18,206 feet above the sea level, and which is said to be "the most symmetrical cone of the North American continent." The photographing party, in order to accomplish their errand, were fifteen consecutive hours on the march.

FROM Allen Brothers, of Detroit, we have received some fine examples of interior photography. These consist of handsomely furnished rooms filled with artistic furniture, and presenting some of the luxurious finishings of modern homes. The pictures are well taken and show fine details in the fabrics of the furniture and also in the finely carved woodwork. They also exhibit, above all things, admirable choice of light and an artistic eye on the part of the photographer, especially in the selection of the point of view and the arrangement of the various pieces to give pleasing and harmonious effects.

THE ENGLISH ANNUALS, in the form of advance copies, are before us. The *British Journal Almanac*, with its crowded pages of advertisements and reading matter, is well up to time under the able editorship of the veteran J. Traill Taylor. The volume includes 380 pages of reading matter and 762 pages of advertisements. The *Year Book of Photography* is also well laden with a rich store of photographic knowledge and experience, the reading matter covering 256 pages and the advertisements about the same number. We need not say that they should be in the library of every progressive photographer; they are too valuable to be neglected. We understand that a stock of them will be on hand for American readers at an early date through our publishers.

THE BULLETIN is one of the best photo publications. I never think of doing without it, and have taken it from the first number. W. H. LOCKHART.

I HAVE been receiving the BULLETIN regularly since I subscribed, and I am very much pleased with it. PERCY SHEPARD.

LETTER FROM GERMANY.

BY DR. H. W. VOGEL.

Photography Without a Photographer.—*Scarcity of Platinum.*—*The Carbon Process and Stripping the Negative with Fluoric Acid.*—*Eggenweiler's Gallery : Construction.*—*Rugel's New Zircon Light.*—*Schirm's New Flash Lamp.*—*Landscape Cameras.*

WHAT is the latest novelty? Photography without a photographer. The reader is undoubtedly of the opinion that this concerns amateur photography, but he is mistaken. It is nothing more or less than an automaton, as now exhibited everywhere for the sale of cigars, candy, etc., without the presence of a vendor. A sixpence is thrown into the slit of an iron pillar, the individual then poses in a chair about 4 feet distant, waits until a bell sounds, gets into proper position; a minute later there seems to arise sudden life in the mysterious pillar, and the finished ferrotype makes its appearance through another opening. It is, of course, without frame, but an attendant is present who furnishes the same gratis. What more can we expect? The apparatus is nothing entirely new. Such a construction was already patented a year ago by Fögs in Hamburg. But it has been displaced lately by the one of Ramspeck in Hamburg, and I must confess, after becoming acquainted with the mechanism, that it is a clever idea. The apparatus resembles a round stove. On opening the iron door of the same, a clockwork is seen below, putting the whole mechanism in motion by a spring. The principal part is a vertical axis, acting as rotating power for a plate-catcher. At the moment a sixpence drops in, shutting off the electric current, a ferrotype plate drops from a carrier, is caught by the catcher and moved horizontally around a ring in a vertical position. This ring now contains several circular dipping baths of gutta percha, into which the plate, held by the catcher, is immersed, lowered and then raised at certain intervals.

The construction is very ingenious and still simple. The plate passes first the collodion bath, after that the silver bath, and then the bell sounds, after which the exposure takes place. It plunges now into the developer, washing bath, fixing bath, again into a water bath; from there it is moved outside of the circle and dried over an invisible flame. The whole process lasts about two minutes. Such an apparatus was exhibited last summer in Frankfort, attracting a crowd of people all day. Undoubtedly the apparatus will immigrate to the United States before long. At present it furnishes only ferrotypes, but improvements for instantaneous views are expected.

From Petersburg they write about the present surprisingly high price of platinum. According to information from the Ural, all the platinum which can be produced within the next ten years has been bought up by foreign firms. This is the reason for the extreme high price. At the beginning of this year it was 2,500 to 2,700 rubles per pool (=16.30 kils.); in May English speculators paid 8,000 rubles, and a few weeks later contracts were made with a French society for electric illumination at 12,500 rubles per pool.

The high price of silver belongs fortunately to the past, but we will not so easily get over the high price of platinum, and I would advise all photographers to substitute the carbon process in place of the platinum process. It furnishes just as handsome pictures and with very little more trouble. It necessitates, of course, a double transfer, which is not agreeable to many. But it is now an

easy matter to strip and reverse gelatine negatives. The process is old but applied by only a very few. Fluoric acid is used. This is kept in gutta percha bottles. Glass and the hands have to be protected. It should be measured in silver thimble with wooden handle, and must be diluted with a hundred times its volume of water. Asphaltum dishes should only be used. The acid is harmless in a diluted condition. In this diluted acid the gelatine negative is placed. After about two minutes it will strip completely from the glass. The film may then be placed in water. Here it stretches about one-third of its length and width, so that a picture $6\frac{2}{3} \times 10\frac{2}{3}$ will appear in place of the 5×8 . A larger size is thus obtained to the advantage of the photographer. The film is left under water until the desired size of extension has been reached, and the skin is caught again under water upon a glass, and left to drain in a horizontal position. The facility and rapidity with which the work proceeds is generally perplexing. If carbon prints or collotypes are desired they are reversed.

For the last two years the gallery construction of Eggenweiler has been recommended, and I believe that it is of particular interest for America, with its brighter sunlights and less darker days. The most peculiar feature of the gallery is that it has no skylight. It is a high room situated on the north side, with a northern glass wall 20 feet high, but without glass roof. The roof, which admits no light, does not incline towards the front, but falls pretty sharply towards the rear, and is painted with a light color on the inside. At a certain height, about 10 feet from the floor, a semi-transparent white covering of gauze has been spread horizontally. This receives a strong light from the extending glass wall and the reflecting roof, and serves as a substitute for the top light. I, for my part, do not consider this screen necessary. The Court Photographer, Mr. Kuntze, deems it worthy of our consideration. It cannot suffer from rain or snow, and has the advantage of excluding the sunlight completely, besides being much cheaper.

Mr. Richard Hugel, as representative of Setten & Company, exhibits a new incandescent gas lamp of the latest construction after Dr. Auer's system, for enlargement. The principle of the same is based upon the essential heating power of the gas brought to combustion in a Bunsen burner by application of the lighter hydrocarbons (petroleum gas) and repeated suction of air containing oxygen, so that the illuminating power of the glowing zircon body hanging in the flame is thus considerably increased. The apparatus necessary for this consists of a tin dish with two projecting short pipes to which is attached some rubber tubing. Through one of these tubes air is introduced into the dish pneumatically by pressing the rubber bulb, while the air, impregnated with petroleum gases, passes from the other tube and reaches the Bunsen burner. The illuminating power of the Auer burner is thus brought to a strength of from sixty to eighty candles. The price of this light, including the gradual consumption of the zircon body, is from 4 to $4\frac{1}{2}$ pennings per hour. The effect of the flame and its whiteness is brilliant. Upon a very similar principle the benzine flash-lamp of Schirm has been constructed.

The apparatus consists of a tin vessel, *a*, filled with spongy matter which is soaked with benzine.

All free liquid is poured off. A small tube, *c*, which empties into the vessel, is connected with a pneumatic apparatus. This apparatus (rubber bulb) must

be provided with two valves which carry the air only in one direction, and prevent a back-suction from the flame. In the upper part of the lamp is a cover, *a*, that can be screwed off, with fine openings around a circular line.

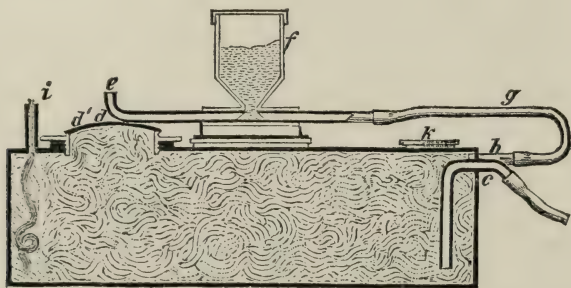
Above the middle of this circle with the opening for the gas passage, the magnesium blow-pipe, *e*, with the magnesium-carrier, *f*, can be inserted.

This blow-pipe is connected by a thin rubber tube, *g*, with a pipe-end, *h*, near the pipe, *c*.

Close to the above-described burner is a small tube, *i*, filled with a wick at whose end the flame is burning, which serves to ignite the emitted gas.

The action of the apparatus is the following :

By pressure upon the bulb air is forced through the vessel and is fed with benzine gases, passes partly through the ring of fine openings, *d*, ignites at the flame, *i*, and forms a long, extremely intense flame. Another part of the air, saturated with combustible gas, passes through the magnesium-conducting pipe, *e*, receives here the magnesium powder and conducts it to the above-mentioned flame for combustion.



In this way an extremely intense and complete combustion is obtained and the illuminating power of the burning magnesium powder is considerably increased.

This new lamp unites the advantage of the Bunsen burner (with great heating power) with the easy transporting facility of the former spirit lamp, harmless manipulation, great economy in burning material, and increased illuminating power. While the spirit-lamp, when frequently used, had always to be refilled again and a considerable consumption of burning material took place, one filling will now be sufficient for 1,000 flashes, and the lamp, containing no free liquid, can be transported without inconvenience. Every danger is also excluded, as in case of an upsetting of the lamp no combustible matter will run out and the small flame will be at once extinguished. The magnesium supply for this lamp is so arranged that as soon as the magnesium reservoir stands upright the magnesium powder will fill the blow-pipe of its own accord, and a slight tap on the lamp is sufficient after each flash to effect a new fill with the powder.

If the magnesium reservoir is turned over the magnesium supply is shut off. To fill the lamp the screw, *k*, is opened, a quantity of benzine is poured in and the opening is closed again.

After unscrewing the cover, which protects the ring of fine gas passages, *d*, during transportation insertion of the blow-pipe into the middle of this opening, ignition of the flame and opening of the magnesium reservoir, the apparatus is ready for use.

To keep the apparatus in order, the small opening, *a*, should be cleaned sometimes with a needle, and it should not be neglected to turn the reservoir over before the last flash to prevent the magnesium powder from reaching the lamp part during transportation.

As soon as the flame becomes weak and is not very perceptible, a new filling is required. If a continued light-stream (by blowing, for instance) is driven through the lamp and the magnesium reservoir is slightly tapped with the fingers, a lasting light will be produced.

An explosion of the above described lamp is entirely excluded, as it is well known that this cannot take place in a space filled with a finely divided solid mass (wire, sponge, wood fiber, etc.)

At the last convention of "the friends of photography" a good deal was talked about the construction of lighter view cameras, the present forms being rather too heavy. The efforts for more comfortable tourists' equipments, and my recommendation of the $3\frac{1}{4} \times 4\frac{1}{4}$ cameras, seem to have been successful, for that size was represented by the dozen at the exhibition. Formerly the camera was screwed sideways on the tripod if a portrait was to be taken; now the camera is made square, and the back part is so arranged that the holder can be used with equal facility both ways. This prevents a changing of the camera from one side to the other. But the question arises whether this small advantage has not been obtained too dearly by enlarging the volume and weight of the camera. Another novelty is the arrangement for inclining the objective by lowering the front board. It is no question that the slanting position of the whole camera is thus saved, but it should not be forgotten that all this is at the expense of a correct perspective. Crooked lines can only be avoided when the plate is in a completely vertical position and with a small diaphragm.

The most inconvenient part of tourists' equipments is the tripod. It should be absolutely rigid, be high enough and still of a light weight. All this cannot be united. If we had a wood like your hickory, but even tougher, it could perhaps be done.

BERLIN, December, 1890.

[From *Photographisches Archiv*.]

THE OSMIUM TONING BATH.

BY R. E. LIESEGANG.

SINCE platinum is used for the toning of silver pictures, the other metals of the platinum group have also found application. Iridium, palladium and osmium are used for the same purpose. The latter has now been brought into the market by Mercier under the name of "Virage Tricolor."

It is a powder, which consists principally of osmium, ammonium chloride and acetic acid. It is dissolved in water and can be used at once. If a silver print is washed herein it will assume at first a brown tone, but after some time the half-tones will color azure-blue. If the prints are put now in hypo-sulphite of soda, they will continue to tone in the same. Finally pictures are obtained which are sienna-brown in the deepest shadows, and azure-blue in the half-tones, having thus a peculiar effect. These are the results upon arrowroot paper, which with albumen paper is recommended particularly for the process by Mercier.

Upon aristo paper the bath has a somewhat different action. If the action of the bath is interrupted at the same point, which is obtained in about a quarter of an hour, the blue of the half-tones show a strong impression. The deepest shadows, however, are not brown, but olive-green. If the toning bath is permitted to act a little longer, very deep blue pictures are obtained, which have almost a better effect than platinum pictures.

These aristo pictures should not be washed between toning and fixing. If this is done, they are weakened greatly by the fixing soda, and obtain a more neutral tone.

Experiments, to produce a toning fixing bath with this salt, were unsuccessful. I observed that the osmium salt, even if greatly diluted, will color the solution of the hyposulphite of soda carmine-red; a precipitate does not form. This characteristic reaction of the metal can very likely be employed in qualitative analysis.

[From Photographisches Wochenblatt.]

ERYTHROSIN SILVER.

BY J. GAEDICKE.

THE extended application of erythrosin silver for the production of orthochromatic plates justifies the practical importance of an investigation concerning the conditions under which erythrosin will precipitate nitrate of silver. The investigation of these conditions has shown that it is by no means indifferent whether the nitrate of silver is poured into the erythrosin solution or the erythrosin solution into the nitrate of silver solution.

To determine the conditions under which these two bodies precipitate, two filtered solutions were produced, namely:

First.—An aqueous tenth-normal nitrate of silver solution, which in 1 c.c. contained 0.017 grm. nitrate of silver.

Second.—An erythrosin solution in 1 part of water and 3 parts alcohol, which in 1 c.c. contained 0.002 grm. erythrosin.

With these solutions the following two tests, *A* and *B*, were made:

A.—One c.c. tenth-normal nitrate of silver solution was diluted a little with alcohol and gradually mixed with the above erythrosin solution until precipitation ceased and the erythrosin was slightly in excess.

The limit of reaction was discovered by placing a drop of the liquid upon white blotting-paper. The red precipitate of erythrosin and silver remains as a red circle, surrounded by a moist halo. As long as the erythrosin is not in excess this halo will be colorless, but the least excess will give it a reddish tint. This appearance took place when 10 c.c. erythrosin solution had been added. Therefore 20 parts erythrosin had precipitated 17 parts nitrate of silver. But the precipitate thus formed was found able to precipitate still more nitrate of silver. To determine the limit of this reaction the precipitate was mixed with a tenth-normal nitrate of silver solution, shaken, left standing for a little while and then tested. This was continued until a weak excess of nitrate of silver could be proven. The test was made in such a way that a drop of the liquid put upon white blotting-paper and the halo forming around the red circle were touched with a solution of ammonium chromate. As long as the halo colored yellow no excess of silver was present, and the first indication of such was when

the halo became brownish-red by the reaction. This took place after 1 c.c. nitrate of silver solution had been used.

The erythrosin silver had therefore subsequently absorbed just as much silver as it contained already. The precipitate had therefore united $2 \times 17 = 34$ parts of nitrate of silver and 20 parts of erythrosin.

B. Reversing the test, other figures were the result. Ten c.c. of erythrosin solution were mixed drop by drop with tenth-normal nitrate of silver solution, and the test made upon blotting paper until the halo was no longer pink but colorless. The requirement for this was not 1 c.c. nitrate of silver solution as with *A*, but only 0.5 c.c. Here 20 parts erythrosin have therefore been precipitated completely by only 8.5 parts nitrate of silver. The erythrosin silver has therefore carried along just as much erythrosin as it contained thereof. The colorless liquid on top of the precipitate had a fluorescing green color. The red precipitate absorbed still nitrate of silver, but much slower.

To produce the brown halo of chromate of silver, 1 c.c. nitrate of silver solution was required.

In this arrangement of the test 20 parts erythrosin had therefore bound 25.5 parts of silver against 34 parts, as with test *A*.

For the production of the richest erythrosin silver the following prescription results therefore from above tests :

Dissolve 17 parts nitrate of silver and pour into this liquid a solution of 20 parts erythrosin, add after this another solution of 17 parts nitrate of silver and let stand for several hours under frequent stirring ; finally add a few drops of erythrosin solution.

[From the *British Journal of Photography*.]

A NOVELTY IN PRINTING.

BY W. B. BOLTON.

PHOTOGRAPHERS—especially portrait photographers—are, like the Athenians of old, ever on the lookout for “some new thing ;” and during the past twenty years numerous have been the tricks and dodges, patented and otherwise, that have been introduced to give variety to the methods of printing in general vogue, and to induce custom by their novelty. I am not now alluding to such new forms or dimensions as the *carte-de-visite*, “cabinet,” and other fashionable sizes, or to such ephemeral “novelties” as the “diamond-cameo” portrait and such like, but rather to special styles of finish in which, by more or less mechanical means, a *quasi* artistic tone is given to the picture.

Such, for instance, as Sarony’s photo-crayon portraits, in which a positive transparency was backed up by a lithographed background representing a vignette or scroll drawing, the result being a picture apparently “finished” in crayon by an artist. Another plan, patented under the name of “photo-mezzotint,” I think, consisted in photographing the figure or bust against a white or very light background, and after printing out the figure portion of the picture, introducing some sort of a stipple background by double printing from a second negative, such stipple being produced by photographing under suitable conditions of lighting a surface of morocco leather or similar material. The effects produced in this manner became very popular for a time, but soon lost their attraction for the public.

At the present time the most effective style of portrait is undoubtedly that known as "dry point," but this must be removed from the category of "mechanical" methods, inasmuch as the effect requires the work of an artist, and is not produced by any "royal road" method. The style of treatment, combined with the neutral black tone adopted, gives such productions the appearance of highly finished engravings or etchings, and renders them as unlike as possible to the ordinary and conventional photograph.

The popularity of such methods, as well as the universal practice of "finishing" all enlargements, at least in monochrome, go to show that the present fashion tends in the direction of anything that offers a fair imitation of the handiwork of the artist without necessitating the possession of any great amount of artistic skill. To some of the more æsthetic readers of *The British Journal of Photography* it may seem a somewhat ignoble ambition to desire to produce artistic effects without artistic skill or training, and a misapplication of energy to attempt to describe how it may be done. But there are many, very many, who, while fully capable of appreciating artistic effects, have not had the necessary mechanical training in the methods of their production, and such are scarcely to be blamed for using any little device that will help them to give an artistic character to their productions that they could not otherwise obtain.

The method I desire to describe is one that suggested itself to me while making experiments in connection with the production of mechanical printing blocks; and though I have not worked the process out with any definite intention of making it a process, I have in a rough manner produced effects that offer the promise of "great things" if the method be properly exploited. In the production of printing blocks from a photographic negative it is necessary to break up the natural half tone of the photograph into a grain or stipple which represents in an inferior manner, in the reproduction, the true gradations of nature. It seems, therefore, a decidedly retrograde step to voluntarily adopt the plan which, under the conditions stated, is compulsory, and to substitute for the true and beautiful gradation of nature a spurious and artificial one. Yet such is my intention, and I can only argue in defense the craving that seems to exist for something removed from the every-day photograph.

My readers may think I am about to recommend them to adopt photo-mechanical instead of other methods of printing, but such is far from being my intention, for many reasons—the processes are too difficult, the results, except in experienced hands, very inferior, and the trouble too great where only a few prints are required. I am speaking now of actually making a block and printing it in the printing press. But a precisely similar and perhaps superior effect can be obtained with practically no trouble at all by printing on to ordinary photographic paper in the same manner as upon the prepared block; in other words, by producing upon albumenized or gelatino-bromide paper instead of upon a surface of chromated gelatine or bitumen an image broken up into grain or stipple.

I have often been struck when trying the printing effect of a negative, or perhaps of a screen, with the beauty of the result produced even upon albumenized paper when the image is converted into stipple; but when the black tone of platinotype or of gelatino-bromide is substituted for the uncertain color of the albumen print, the illusion is perfect, and a pure mezzotint effect is produced. Under favorable conditions, and with a suitable screen negative, I can conceive

the possibility of producing a better effect in this manner than by the most carefully prepared and worked block, for there is no danger of spoiling the delicacy of the gradation in the etching process or in inking. On the other hand, there is no opportunity of "dodging" the etching to produce effects, nor of working on the block after it is etched; but a good deal may be done by selection of a suitable screen, and on this point I may have something to say on another occasion.

The requirements for trying the process are not numerous, being confined chiefly to the screen negative or negatives, for two or three of different grades of fineness will be desirable. This, however, is the difficulty; such screens are not readily obtainable, and then only at considerable cost. For trial purposes the methods described in a leading article a few weeks back will enable the photographer to prepare his own screen, or if a natural grain similar to photogravure be preferred the following plans can be adopted:

Take a sheet of tolerably fine glass paper and cement it by means of gelatine or glue to a piece of plate glass, the smooth side of the paper in contact with the glass. When perfectly dry, convert it into a sort of Woodbury mould by pressing a sheet of thin tinfoil—previously brushed over with a solution of India rubber in chloroform—into close contact with it. This can be most conveniently done by passing the whole between the India rubber rollers of a wringing machine, if such be at hand; or it not, by carefully going over the surface, commencing at the center, and with the fleshy part of the palm of the hand pressing the foil into the grain of the glass paper. When this is quite dry, it may be used as a matrix from which to form any number of screens.

To do this, make an ink consisting of gelatine 80 grains, water 1 ounce, colored by the addition of a little liquid India or China ink. The quantity of coloring matter can only be ascertained by actual experiment, as the samples of ink vary so greatly in strength that no reliance can be placed upon any statement of qualities. What has to be borne in mind is that the screen must be very thin, and that therefore the ink must not be too highly colored. Next we want a thin transparent film, and here spoiled celluloid negatives come in very handy.

To print the screen, lay the plate glass carrying the glass paper and tinfoil on a solid and level table, and pour on to the center a pool of warm gelatinous ink. Upon this the sheet of celluloid is laid, "roughed" side downwards, and on top of this a sheet of stout plate glass as level as possible. Apply the weight of the body, and squeeze out as much of the ink as possible, keeping up the pressure for at least two or three minutes, or until the ink that has oozed out has set; then, removing the plate glass carefully, strip the celluloid from the matrix, and, if all has gone well, the result will be a negative representing the grain of the sandpaper in varying grades of opacity.

I should have mentioned that before inking the matrix it should be smeared over by means of a soft rag, with a mixture of olive oil and paraffin in the proportion of 1:4, in order to prevent the ink sticking to the mould. If the gelatinous ink shows a disinclination to adhere to the celluloid, the latter may be prepared by brushing it over with the well-known varnish of bleached lac dissolved in solution of borax.

If a hydraulic press be available a better mould will be produced by placing the sandpaper in contact with a piece of smooth sheet lead, and submitting:

them to pressure between two sheets of iron or steel, by which means an impression of the rough surface will be reproduced in the lead.

It may be found more convenient to employ a coarser kind of sandpaper, and after obtaining a screen in the manner described, to reduce the grain in the camera to a suitable degree of fineness. But, on the whole, I think the more uniform result is obtained by using a fine grain at once. If any difficulty be experienced in getting sufficiently fine and uniform glass paper, powdered emery of any degree of fineness—represented by the number of apertures to the inch of the mesh employed in sifting it—can be obtained, and may be utilized in a variety of ways, which would take up too much space to enumerate here.

As a matter of course, negatives may be taken direct in the camera for this process by interposing the screen negative just in front of the plate; but I imagine the principal use of the screen will be in contact printing from negatives produced in the ordinary way. Either plan produces good results if properly worked.

In conclusion, the process is almost equally applicable to any size of picture, only the grain must be suited to the dimensions. For small portrait work a degree of fineness represented by from 100 to 120 lines or dots to the inch will be found suitable, and coarser in proportion to the increase in dimensions. The grain may be much finer than would be admissible if it were intended to print from an etched block.

A SCARECROW'S SHADOW.

BY ADELAIDE SKEEL.

It is the story of a shadow which fell not on the light sensitive salts of a gelatine emulsion, but on the conscience of a boy. It is the story of a picture which never was taken, of a slide which never was drawn and of a holder without a plate. It is the story of some one who was no one, and of a Christmas card which was neither made nor sent.

There is no denying that photography is expensive, and when a benevolently inconsiderate summer boarder gave her ten dollar outfit to her landlady's son, she little knew what a heavy burden she laid on the hard-worked woman. Harry had been idle all his life, but now he was both idle and expensive. His mother bore the strain, however, cheerfully as long as the "guests" liked to be taken, but when the last one had gone, and left her comparatively alone on Long Island, she said with firmness:

"Henry, stop it, or we shall both be in the poorhouse before next season."

Harry, who had scored the usual successes of beginners, and had run up the usual bills at the village drug store and local professional photographer's, heard this threat with no more alarm than the emancipated Calvinist hears the threats of the preachers about future reckonings; and he had, moreover, so overweening a faith in his mother's continued ability to support him till he found a salaried office with large wages and small work, that nothing but lack of both credit nor money could stop him.

He had never spent all the money he had wanted, although he had, always, spent all he had; hence, photography seemed to him no more extravagant than smoking cigarettes or other things fellows had to do if they went about with "the boys."

Miss Douglas had said that this same thing his mother called "fooling" was art, and he felt sure if this same sordid mother only knew all else Miss Douglas had said about "a tender feeling, a touch of genius," and so on, there would be no haggling about a paltry fifty cents now and again. However, it is not easy to explain such things to outsiders like a boy's mother, and, besides, there was much else he did not himself quite grasp, save, in the general way, that Miss Douglas liked him immensely, and he let her. Novels to the contrary, our summer guest had not the ghost of a chance of "breaking a country heart for pastime e'er she went to town," since not only are Long Island hearts exceptionally hard to break, but twenty-eight is too far removed from eighteen for the spell to work, and had Harry thought at all of the tautly dressed girl he would have said she "was a nice old thing." It was the little wrinkles around her bright gray eyes, maybe, or the thinness of her pointed bang or the bony tendency of her tailor-made figure, or more likely than all else, the presence of a little niece, Dolly, who stood always ready to pose, that made Harry forget to look at the more mature auntie. However, it did not matter to any of the party who spent every sunny day in the garden, usually in the strawberry-bed, grouping about an old scarecrow, feeding him fruit or offering him flowers. Miss Douglas, indeed, grew so fond of him that, when the summer was over, the day she gave the camera to Harry she presented this faithful model with her old striped blue and white blazer, to be worn, she said, "Till Harry took a better picture of him than any she had made."

"Send it to me, please, Mr. Duff," said Dolly, with a bewitching blush, and then the stage rolled away and the season was over.

The scarecrow wore the gay jacket all through the windy autumn, a queer enough figure to be sure, faithfully guarding a strawberry-bed where no strawberries grew, his one rake-pole leg knee deep in fallen leaves, his widespread umbrella arms tossed like weather vanes hither and yon, a mocking crow atop his old felt hat, and his every gesture proclaiming that summer was dead. It had been a dreary winter to others besides this watchman, since lack of funds had made it impossible for Mrs. Duff to rent a city house, and forced Harry, willy-nilly, to vegetate on the South Shore. He had not found the office-work yet which required no training and paid a big salary to raw amateurs, so he stayed on at Dahlia Cottage and bemoaned his hard fate. December snow was beginning to add another charm to winter on Long Island when, perhaps, the season's lack of holiday cheer suggested to this boy "with feelings" that he might take a picture of the old model in the garden and send it to sweet Dolly as a Christmas card. Instantly the long-neglected camera was dragged from its hiding-place in the sweetmeat's pantry—a pantry, alas, long since eaten bare by hungry boarders—and set up despite the whistling wind in the frozen garden, the patient scarecrow focused, and all made ready, when a trifling mishap prevented farther artistic proceedings. Harry remembered that his holder was empty and he knew he had no more plates. Alas and alas! Why had cruel fate given him expensive tastes and no bank account? Why had he a mother who grudged him a paltry sixty-five cents once in a hundred years just for a little photographic lark? Was she never young herself, he wondered. Thus, grimly plunged in despair, he was moodily kicking the melting snow under his feet when suddenly a piece of paper fluttered down on the ground as if the old scarecrow had handed it to him with the compliments of one who sympathized.

What was it? It looked like a check, and when the boy unfolded it, his hot blood all in his finger-tips, he read an order on one of the largest houses in New York for \$25 worth of photographic goods. It was drawn to the order of Miss Douglas and indorsed on the reverse side with her signature. What did it mean? Had she meant it for him? Why had he never seen it before? Why had no gale of wind blown it out of the blazer pocket before now? Was it his? Surely, it was quite like Miss Douglas' fantastic mind to hide the thing and trust to some chance wind of heaven to waft it to his feet.

The boy said this over and over to himself, while all the time visions of what the money would buy danced through his head. Perhaps a Kodak, or, better, a large view camera, with unlimited attachments and plates enough to take every inch of sandy Long Island; or, again, there was that promised picture of the scarecrow for which Dolly had asked. Surely, surely, that was the one thing to be done, and done quickly. It was a duty, and this order made it possible. He knew, to be sure, that a good deal of time had slipped away since Dolly bid him good-by and said, "Send it to me please, Mr. Duff;" yet that was but another reason for making haste to get the order off and to get the things in exchange which would make photography once more a possible thing. It had been a foregone conclusion from the first moment that the letter would be written, and I think myself if the Recording Angel wrote in his book that the boy sent the paper to the great New York house as soon as he found it, his minute would not have been much out of the way, although, to be strictly just to Harry, to whom such windfalls were not an every-day matter, I have carefully put down all the pros and cons—mostly cons—which passed through his mind before the deed was done.

* * * * *

"Miss Douglas, if you were not aware that this order was sent in your name the sender is a forger, and nothing less."

"I am so sorry about it," faltered the girl, breathless with the many stairs she had climbed to obey the summons received from the big photographic house, and also a little put out because the firm had not asked her to sell her ten-chapter story to the magazine which sometimes smiled on her, and which had in one instance paid \$25 for some of her sketches. In a minute she found more voice in which to say, "I lost the order last summer at the seashore, but the boy is welcome to it, for he is almost a genius, and so poor. His mother does not help him a bit in his art-longings, but I will. Give him the things, and do not let him know they come from me, for he is so proud it would kill him. My heart aches for him way down on the South Shore——"

"He will soon be on an island nearer the city," said the cashier, "if you help make him a thief, Miss Douglas."

"I make him a thief?"

"Nothing less."

"Do you refuse to send the things?"

"We prefer not."

"Then give me the order."

The surprised cashier gave it to her, and although he was a married man and thought he knew all about lovely woman, and also all about his own business, had now a shock in seeing the lady deliberately tear the slip of paper which had

survived so long in the scarecrow's blazer pocket, into a thousand pieces, and then leave the room without a word.

Winter went and spring came, but no big box of photographic goods reached Dahlias, and it was with a feeling of something like relief that Harry heard his mother say that neither of the Misses Douglas would come that season to board with her.

"They were sweet ladies, both of them ; but when I think of the mess they made on the matting and the towels they stained, I am rather glad we have got rid of them," said Mrs. Duff, while her dutiful son answered, "Yes, dear mother," and then went out to find a buyer for his camera, on whose photographic efforts no scarecrow's shadow would rest. That's all.

ORTHOCHROMATIC PHOTOGRAPHY WITHOUT A YELLOW SCREEN.

BY DR. H. W. VOGEL.

I LEARN from your valuable journal, page 591, that Mr. Cramer, of St. Louis, promised, at the Washington Convention, to place on the market an orthochromatic plate of good sensitiveness which can be worked without a yellow screen.

Allow me to remark to this, that such an orthochromatic plate of good sensitiveness which does not require any yellow screen is already an old thing, done by the late Obernetter and myself four years ago. It is the eoside of silver plate ! You have published in your journal, 1889, a pair of landscapes taken with an ordinary and an eoside of silver plate (taken without yellow screen), which shows the most striking difference in favor of the eoside of silver plate in rendering foliage, clouds and distances. These plates have exactly the same sensitiveness as our best ordinary plates (*i. e.*, Schleussner's) ; they keep very well if they are enveloped in clean paper and stored in a dry room. They have been on the market, in Germany, for four years, manufactured by Perutz, in Munich, and they have been introduced into America for one year by Messrs. E. & H. T. Anthony, New York, and patented since September 14th.

[From the *British Journal of Photography*.]

ETHICS OF PHOTOGRAPHY AND PHOTOGRAPHERS.

BY J. TRAILL TAYLOR.

[A communication to the London and Provincial Photographic Association.]

(Continued.)

PERHAPS it is in the West States of America where retouching has its highest development. A reporter in California interviewed a photographer and conversed on retouching.

"What do you think of that?" said the artist, showing a cabinet portrait. It was simply the likeness of a mild, motherly, middle-aged lady, and the reporter said he could see nothing remarkable about it.

"I suppose not. How do you like this?"

"Good Lord, what a fury!" exclaimed the reporter, as he looked on the deeply-seamed face of an old woman, with lowering brows, thick, cruel lips, and a brutal chin.

"Same subject," explained the photographer, putting the two pictures side by side. "Shows what retouching can do."

"But the retouched one does not look a bit like the woman who sat for it."

"Of course not; that's the beauty of it. The old woman wouldn't have taken the picture if it did. A photographer these days has to be a barber, surgeon and dentist. Look at this."

It presented a man with a bald head and a twisted eye. In the finished picture the eye was straight and the baldness gone.

"For friends of his youth in the West, you know. Here's another."

This time a young man with two of his upper teeth protruding repulsively was shown. The tusks had been extracted by the artist's brush.

"Corresponding with a Boston girl he had never seen, but that he wanted to come out and marry him."

The reporter looked over piles of negatives, and compared them with the pictures made up from them and sent out unblushingly by the sitters as likenesses. Plain women were made pretty, pretty ones given beauty, and in all cases the looks had been vastly improved. No woman seems to want to have herself shown just as she is, and the men are quite as vain. Very young men are frequently amazed at finding how much heavier their mustaches and downy sides are when photographed. The camera makes lean women plump and fat ones slimmer, knocks off ten years at least from the age of the mature, and in ninety cases out of a hundred lies shamelessly. Of course, it is the camera, not the photographer, who is to blame.

A funny instance of slightly unethical behavior comes to my recollection. The once well-known Marcus Sparling was intent upon taking a stereoscopic view of an old house in the Edinburgh Cowgate, but when the light suited, the street was usually full of boys just out of school, who invariably persisted in standing in front of his camera. In this dilemma he applied to me for advice, and, as a consequence, the next day found him with a huge, highly-polished French portrait lens attached to the back of his camera, and pointing in the direction opposite to that where stood the coveted old house. This time the boys, true to their instincts, posed in front of the showy lens in the rear, and stood still patiently during the three or four minutes (these were the days of long exposures) required to get the building photographed. This may be off-color from the ethical standard, but what was one to do under the circumstances?

Here is a view, fully exposed, taken of a railway carriage when the train is certified by the engineer as having been going at thirty-five miles an hour, and yet every one of the occupants of the compartment is sharp and distinct. As the story stands it is simply a marvel, but "seeing is believing." Where the ethics come in is the withholding the explanation that it was taken from the window of a carriage in another train which, on a parallel track, was moving at the same rate of speed, and when consequently one was motionless as regards the other—a phenomenon that can be witnessed every morning about nine o'clock between Finsbury Park and Holloway stations on the Great Northern Railway.

Double printing, when practiced by one imperfectly skilled, may prove a fertile cause of departure from truth. Clouds of a nature totally inadequate to the character of the scene may be introduced. The foreground of a picture may

be Indian, and in the distance may be seen the Crystal Palace with its Sydenham surroundings. One of our members has, by way of a joke, introduced in a view in Epping Forest an alligator disporting himself by the bank of one of its pools; but many things equally non-natural are sometimes to be discovered in a combination photograph. Thus we have the incongruities arising from the attempts to combine in one picture pieces of landscape or incidents taken with lenses the foci of which are widely different. Not only so, but we have in one inharmonious whole parts of views lighted differently from each other, and as many kinds of perspective as there are elementary parts in the finished result. I have seen in a pseudo moonlight photograph the orb of night printed the size of a threepenny piece, when that of even a split pea would have proved too great. Nay, I have, and you all have, seen moonlight photographs in which the dominant light fell upon the objects from a point thirty or forty degrees to one side of the position of the full moon, by which the scene was supposed to be illumined.

The mere mention of photography in the law courts will recall an incident narrated by one of our members a few years ago. It was a case of ancient lights, and in the morning he, as a well-known professional, undertook the task, in the interests of the plaintiff, to show by truthful photography that the erection of a building then in progress would most certainly cause a serious obstruction of the light. He did his work to the satisfaction of the solicitor, and received his well-earned fee. But next morning the solicitor for the defendant employed him to establish the fact, by truthful photography, that by the erection of the building in question no light whatever would be obstructed. He effected this, as in the previous case, in a satisfactory manner, and received his fee. He, doubtless, reasons that there is no more immorality in this than is reputed to be found in the daily practice of legal or patent experts, and other counsel, who give "opinions" usually favorable to those by whom their advice is sought. Nor is there.

A humorous application of mal ethics in photography is to be found in the photographer in an agricultural district, who had often occasion to take negatives of cattle and horses. He overcame the difficulty so often experienced of the animals whisking their tails and spoiling the exposure by the ingenious expedient of keeping a large and various assortment of negatives of cows' and horses' tails, from which he selected one that matched that of any given specimen, and printed it in, having previously stopped out the original that was blurred by motion. This suggests the practice of the photographer in the military town who kept a stock of well-taken figures in uniforms, but minus the heads, which he supplied from those of the gallant patrons of his studio. And this in turn suggests mention of a practice, horrible in its abomination, which more than twenty years ago was—happily not frequently—adopted by some foreign photographers of printing the heads of respectable ladies on the undraped bodies of some of the same sex to whom this qualifying term could not possibly be applied. Of all ethical sins in photography, this one is the vilest, as the junction of head and figure was so perfectly effected as to deceive even photographers themselves.

And dry-plate manufacturers, what of them? Are they ever guilty of practices contrary to ethics? Honestly, I believe they are not. The day has long gone by since any manufacturer sought to utilize his waste or "shady" plates by inserting two or three of them in every dozen package of good plates.

Happily, this system being suicidal, quickly effected its own cure, so it no longer exists.

"Borrowed plumes" is a term which covers several departures from the strict ethical path. I allude particularly under this heading to professional photographers who display in their showcases, as their own work, that which has been executed by others, and also to amateurs who, buying their plates ready prepared, get their developing, printing, mounting, and finishing done by others more skilled, and then exhibit, and possibly obtain medals for it, as their own work. A case is on record in which this was carried to an extreme, for not only was all the foregoing done, but it was done with a borrowed camera, and an artist present had indicated the spot on which to erect it, and the exposure to be given. Well might the narrator ask who of all these should have got the medal that was awarded the picture made under these circumstances?

I have mentioned an amateur of one type; there is another, viz.: the one who, posing as an amateur, yet enters in some respects into pecuniary competition with the professional, doing work for his friends and such of the public as apply at so-called prime cost—that is, cost of material—thereby in many cases depriving the man who has to subsist by the exercise of his profession of his means of living. On the unfairness of such a proceeding it is not necessary I should dilate, especially as it is not unethical and does not come properly within the scope of my subject.

Photographic authors and writers do not usually lend themselves to the encouragement of departures from ethics, but Elbert Anderson, in his book, "The Skylight and the Dark Room," is not so fastidious. He advises that, even "if your sitter sits still and has a good expression, but upon developing the negative you find you have committed a blunder, rush out of the dark room and tell him with a bold face that he moved! You must never be in the wrong; it must always be his fault."

Over a month ago I was discoursing on stereoscopic photography at another metropolitan society, and after speaking of the expedient that had to be resorted to when photographing the moon, namely, taking advantage of her librations, and thus increasing the stereoscopic base from the two and a half inches between the eyes to many thousands of miles in order to show her in the stereoscope as the spherical ball we know her to be, by parity of reasoning I adduced my own experience in photographing a coast line from the deck of a yacht, allowing a space of a few hundred yards between the shots in order by such abnormal displacement to show every creek and jutting headland as they existed in nature, although undecipherable in the monotonously straight coast line as seen by the eye. It was objected that this was not truth. Not, perhaps, as a representation of what the eye saw at the moment, but literal truth all the same. This expedient is an aid to vision on the same principle as looking through a telescope to see an object at a range too great for normal vision, or photographing by microscopic aid an object otherwise altogether invisible.

But mention of the stereoscope suggests malpractices with it which are altogether contrary to ethics. For instance, trimming pictures so as to impart a fictitious acclivity to a railway ascending a mountain which is already fairly steep in itself, as practiced by a well-known photographer; or making a stereoscopic pair of pictures from one and the same negative, by which they undoubtedly coalesce when viewed in the stereoscope, but which are devoid of relief.

"Dodges" are not necessarily antagonistic to ethics. They are generally expedients for expediting the means to the end. Many of them could be mentioned were it desirable or necessary.

Do not look upon me as hypercritical in regard to the latitude permissible to photographers. All things are or may be lawful; the expediency thereof must be determined by circumstances. Let photographers practice every conceivable dodge that they can think of and no offence against the strictest code of ethics will be perpetrated, so long as it is not done, to quote Truthful James, "the same with intent to deceive."

[From the Photographic Review.]

COLOR-SCREENS AND COLORED LIGHT.

THE earliest attempt to seriously cope with the error introduced by photography of giving undue prominence, as tested by our visual powers, to the more refrangible rays of the spectrum, and consequently of insufficiently rendering objects giving out the less refrangible rays—red and yellow particularly—was the use of a colored medium or screen with the lens, which, whilst allowing the rays belonging to the lower end of the spectrum to pass freely, so far obstructed those belonging to the other end as, at all events, to do something towards equalizing their activity. The main objection to the use of the colored screen was that with the ordinary photographic processes the sensitiveness of the plate to the red and yellow rays is so weak that, when other colors are so slowed down as to equal them, the total sensitiveness of the plate has sunk so low that for most purposes it is considered useless.

With the discovery of sensitizing for colors, the conditions of the problem have become a good deal changed; but there is no process, at least none practically worked, by means of which the plate can be sensitized so powerfully for these rays of low refrangibility that they will act with energy proportionate to that of the blue and violet rays—proportionate, that is, to the effect of each color upon the perception of the observer. Photographs have certainly been shown, both at exhibitions and at meetings of societies, in which the mere addition of a color sensitizer, without the employment of a color-screen, has sufficed to make a marked change in the appearance on the negative of colored objects, as evidenced by companion photographs of the same objects taken with an ordinary plate. There is no doubt, however, that this marked improvement does not represent a true relation of color-sensitiveness, but only an approximation thereto, and that these results only point out clearly the advantage of color-sensitized plates, without indicating their complete sufficiency by themselves; and that for anything like a complete proportionate rendering of the scale of color, some of the energy of the blue and violet rays commonly so abundant must be abated.

In abating the vigor of these rays of high refrangibility, two leading methods have been proposed and adopted. The one is the illumination of the subject by a light deficient in the more active rays, and the other is the plan of using a colored medium to absorb some of them in their passage from the object to the sensitive film. The first method—that of using colored light—is, of course, only practicable for a certain class of objects, such particularly as paintings; but with these it has been most successfully worked. When a picture is copied either

by gaslight or by light from a window covered with a yellow blind, it is obvious that there is, as compared with ordinary daylight, a relative abundance of yellow and red light and deficiency of blue and violet; and as a matter of fact we have known these methods worked with considerable success. An orthochromatic plate will indeed help matters, particularly from the fact that being sensitized for the rays which are in these cases abundant, the exposure is not so prolonged as would be the case with an ordinary plate. The advantage of the use of colored light, and consequent absence of the introduction of optical difficulties, was appreciated by the speakers at the technical meeting held by the Photographic Society of Great Britain, on Tuesday last, when Mr. Warnerke described a magnesium lamp with colored glass front, of which he spoke very highly, for the production of orthochromatic effects.

A great advantage of the plan of using colored light over that of using a colored medium in connection with the lens and camera is that in the former case there is no interference with the optical work of the lens. That there is a considerable amount of interference when color screens are used is undeniable. We remember a striking instance of this fact in a photograph published some little time since, showing the very superior manner in which the lights and shades in a landscape, including the clouds, came out in a photograph taken with an orthochromatized plate and a color-screen. A companion photograph showed the scene as photographed with an ordinary plate and without a color-screen. The difference, as far as light and shade, harmony and general truthfulness and beauty were concerned, was greatly in favor of the first-named picture, but the fine detail was gone; there was a slight amount of fuzziness throughout. No doubt there are differences—and very great ones—in the amount of irregularities to be met with in the color-screens, but these are faults of a kind that are inherent, and that are multiplied by every fresh surface that is introduced. One inherent fault that we do not remember to have seen pointed out, is the greater amount of light lost by reflection in the case of marginal pencils of light, compared with those that pass vertically through the medium. If fresh surfaces must be introduced, let them be as few as possible. In this view probably the best color-screen is that furnished by a film of tinted collodion upon the lens. Here there is no additional out-of-contact surface; but, on the other hand, care should be taken to use a collodion that dries glossy, and as free from reticulation as possible.

A plate of colored glass introduces two fresh surfaces, and, although these may be ground optically true, some interference will result which may be trifling in the case of central pencils, but in the case of marginal ones there must, as previously pointed out, be loss by reflection, weakening those parts of the picture which the form of aperture of the lens or stop has already too much reduced. These reflections, too, do not merely represent light wasted, but some of this light finds its way to the plate, whether in the form of discoverable fog or not.

If a pair of optically true parallel surfaces are thus capable of injuriously affecting the work of the lens, what must be expected when a loose film is used, as is sometimes recommended? Doubtless, the best plan would be to make lenses some of the elements—say either the back or front combination—of which are tinted glass. Perhaps some enterprising opticians will furnish such an instrument, or it may be will manufacture a colored cap for use before or behind the lens, made with such surfaces as shall be nearly or quite vertical to

the rays passing through them, so as to reduce reflections to a minimum. The tinted lens plan, however, commends itself to us as not introducing any fresh surfaces at all. In default of the methods recommended, it is strongly to be advised that no additional surfaces, and especially none that are not optically true, more than are absolutely necessary, be introduced.

ASTRONOMICAL PHOTOGRAPHY AS PRACTICED AT THE LICK OBSERVATORY.

BY PROFESSOR JAMES E. KEELER.

[Lecture before the New York Camera Club.]

BEFORE speaking upon the subject of astronomical photography as practiced at the Lick Observatory, I would beg leave to preface the remark that this is not my department, and that most of the specimens I have with me are the work of others.

Astronomical photography presents no special photographic difficulties, fewer indeed than ordinary figure and landscape work, but a very considerable knowledge of astronomy is necessary, and we shall not be very far from the mark if we look on it as consisting of three parts of astronomy and one part of photography. If an ordinary photographic camera is pointed at a star and the plate exposed, a blurred image will result, due to the motion of the heavenly body. Any attempt to obviate this blurring would be found useless unless the box is revolved about an axis parallel to the axis of the earth. In considering the methods for obviating this indistinctness the photographer would be led into an investigation of right ascension. Even with a perfect clock, adjusted so as to impart a motion to his camera equal to that of the object, changes in refraction and other causes would necessitate his inquiry into some of the principal points in astronomy.

My object to-night is not to enter into these details, but to describe in a general way the photographing of the heavenly bodies, with especial reference to the methods employed at the Lick Observatory.

The history of its foundation is probably well known to all present. Its illustrious founder, leaving Pennsylvania as a boy, working as a cabinet and picture-frame maker in South America, acquired in California by hard work and judicious investments a large fortune, the larger portion of which he gave for the construction of the famous observatory which bears his name.

The building contains the finest instruments in the world. Situated at an elevation of 4,200 feet on Mount Hamilton, about 13 miles east of San José, and about 50 miles from San Francisco, it is above the lower strata of atmosphere which, with its dust and dirt, would impede its work. The main building is about 300 feet long, lying nearly in the magnetic meridian. At each end is a dome, one containing the 36-inch the other the 12-inch equatorial.

Views of the observatory of Mount Hamilton, and of Mount Santa Isabelle were here shown. In the large dome are the large telescope, the spectroscope and the photographic apparatus, including the largest camera yet built.

As you well know a convex lens will form an image of any object in front of it, and a concave mirror will also form an image. Both images are too imperfect for photographic use. In the case of the lens the image is imperfect because of the imperfect figure of the lens and because of chromatic aberration.

With the mirror the imperfect figure is again the cause. We may correct the lens by using two lenses of different glass. Here again the combination is different for the visual brightest rays and for those affecting the photographic plate.

Here the lecturer drew curves showing the difference in lenses corrected for visual and actinic rays.

From a consideration of the phenomena from which these curves are deduced the operator can design his lenses. In the Lick telescope the instrument is changed from a visual to a photographic telescope by placing on an additional lens the photographic corrector. This changes the focal length, lessening it by about nine feet. Here the plate-holder is placed, a slit being cut in the tube for that purpose. The telescope being focused on a practically infinite object, very little focusing is required, and this is effected by movement of the plate-holder itself, the great size of the telescope making it easier to move the plate than the telescope. The plates in general use are 8 x 10 Seed. The telescope follows the star by clockwork, and any slight deviation of the image on the plate is corrected by moving the plate-holder, the object being observed by a small visual telescope placed on the side of the tube.

The plates are slowly developed in a weak pyro-potash developer. The development, unless the subject is the moon or some large planet, cannot be closely watched, but is regulated largely by time and by what experience has shown to be correct. In many cases, as in star clusters, nothing is visible until after fixing. In the case of the 12-inch and the 6-inch telescope, these being easily manageable, the image is kept on the plate by moving the instrument. The Henry Bros. have two telescopes fastened together, one a visual, the other a photographic instrument. The star is watched through the visual telescope and kept on the spider lines, thus keeping it always in the same position on the plate. The photographs by these gentlemen are probably the best yet made. Astronomical photographs are small and are not to look at but for measurement, and a small round image is required. With the moon and planets the case is different. For the moon with the Lick telescope one-quarter to one-half a second exposure suffices, and Jupiter is obtained in four to five seconds. Sometimes the image is enlarged before being photographed, and here, of course, the exposure is prolonged in proportion to the amplification.

A star which is invisible through the visual telescope can be photographed, for while the effect produced on the eye is immediate, that produced on the photographic plate is cumulative. Here photography has been of the utmost use to astronomy. On the other hand, small surface details of planets cannot be as accurately pictured on the plate as to the eye. Jupiter, for example, always photographs in a more or less blurred manner, the blurring being due to irregular refraction in our atmosphere. These small details are better seen by the eye. With regard to nebulae photography has been particularly successful. These are very faint objects, and only by the application of photography can the details of their form be made out.

The photographing of star clusters is a difficult matter, for while the exposure for a star of the first magnitude may only be a fraction of a second, that for one of, say, the sixteenth magnitude, may require even two hours, so that it is impossible on the same plate to photograph with any degree of accuracy two adjacent stars of different magnitude. Photographs of double stars, or of fairly

close couples, may be obtained, thus obviating the necessity of micrometric measurements at the eye-piece of the telescope itself.

Another method of observation is that of "trailing." If we point the telescope at a star and fix the instrument the motion of the earth will produce a trailing image across the plate, and by this way difference in declination can be obtained with great exactness, as well as difference in right ascension. We can thus obtain the differences in the position of the stars and get their displacement in the heavens due to the motion of the earth.

Several slides, showing the surface of the moon, sun spots, solar eclipses, the Milky Way, the nebula in Andromeda, Jupiter, Mars, Saturn, and others of the heavenly bodies, were shown on the screen, illustrating the great use of photography to the astronomer and to the spectroscopist.

THE WASHINGTON REPORTS OF THE P. A. OF A.

To the Editors of the BULLETIN:

IN BULLETIN No. 21 I saw my name. It led me to read the article. To my surprise it intended to report what was said by me at the Photographers' Association, which was held at Washington. I had no papers to read, but was called on to say something about printing, toning, etc. It was on Thursday evening, August 14th last. In the article I have been incorrectly reported, such: "as I am now making albumen paper for my own use." This I have not done since 1881. But I continue to prepare plain salted papers. It also says I use a paper prepared with acetic acid instead of citric acid. This article has taken the wind out of my sails, and before I could be consoled I had to read the third chapter of Job. Why don't the association employ a wide-awake stenographer, one that has some knowledge of photography and its terms, and keep awake, so when you look at it you may know it is alive. I wonder if Job was reported, and that caused him to write the third chapter.

JOHN R. CLEMONS.

OUR ILLUSTRATION.

THE silver prints with which we illustrate this issue of the BULLETIN were made with the celluloid negative films from the factories of our publishers. They are certainly good examples of work done on this substitute for glass, which is now used so extensively by the tourist photographer. Those of our readers who are contemplating some extended journeying next summer should practice with celluloid films and save the toil of carrying glass plates and the risk of breakage. These climax films have an excellent reputation both here and in Europe.

THE DAGUERRE FUND.

SUBSCRIPTIONS ARE STILL IN ORDER.

THE following is a partial list of the contributions to the Daguerre monument as far as we have received notice of them up to this date. We shall take pleasure in adding to this list as the names are sent to us. These are in addition to the money raised by dollar subscriptions:

Dr. A. H. Elliott, \$25; G. Cramer, \$500; E. & H. T. Anthony & Co., \$500; W. V. Ranger, \$10; W. G. Entrekin, \$100; C. H. Codman & Co., \$100;

Benjamin French & Co., \$100; G. Gennert, \$50; Rhinehart (City of Denver), \$50; Sheen & Simpkinson, \$25; D. P. Thompson, \$25; L. W. Seavey, \$25; Hetherington & Coover, \$25; *St. Louis and Canadian Photographer*, \$25; S. J. Dixon, \$25; G. D. Milburn, \$25; Brodie Mfg. Co., \$25; John W. Morrison, \$25; D. R. Coover, \$25; Fowler & Slater, \$25; Catherine Weed Barnes, \$20; S. L. Stein, \$20; L. C. Overpeck, \$10; L. J. Ullman, \$10; Mr. A. J. Riddle, \$10; *Photographic Herald*, \$10; Ph. Bonte, \$10; J. R. Pearson, \$10; Baker's Art Gallery, \$10; F. E. Hastings, \$10; Buffalo Argentic Paper Co., \$10; J. G. Edgeworth, \$10; E. M. Estabrooke, \$10; Loney & Gable, \$10; E. J. Pullman, \$10; G. H. Van Norman, \$5; W. Stuber, \$5; E. Stanton, \$5; J. M. Brainerd, \$5; E. Fieger, \$5; A. W. Judd, \$5; Eddy Bros., \$3; G. L. Hurd, \$2; T. M. Mackey, \$1; J. R. Clemons, \$1; Bausch & Lomb Optical Co., \$20; J. M. Appleton, \$25; M. A. Seed Dry Co., \$100; R. H. Moran, \$25; Geo. Murphy, \$20; F. W. Guerin, \$10; Arthur, \$10; C. Gentile, \$10; C. W. Motes, \$10; Benjamin Brothers, \$5; Elrobora, \$5; E. Decker, \$5; S. B. Brown, \$5; Eugene Smith, \$5; F. Plotser & Co., \$5; M. G. O., \$2; Geo. Sperry, \$2; Adam Heimberger, \$2; Charles E. Craven, \$2; J. E. Smith, \$2; J. C. Fitzgerald, \$2; W. E. Eusten, \$2; W. Noel, \$1; L. M. Jackson, \$1; S. F. Sloan, \$1; A. M. Wiggins, \$1; J. W. Vance, \$1; A. M. Collins Mfg. Co., \$100; John Carbutt, \$100; M. Carey Lea, \$10; *The Photographic Times*, \$100; "Kicker," \$5; *The American Amateur Photographer*, \$20.

SOME IMPROVEMENTS IN THE BULLETIN.

THE next number of the BULLETIN will be the first of a series having some well-marked improvements. A handsome new cover from original designs, specially drawn for the purpose, will add very much to the outward appearance of the journal. By a change of type also much additional matter will be found in its pages, giving the readers of the BULLETIN a larger amount of photographic information without additional cost. In addition to these improvements, the publishers have arranged to give extra full page illustrations as well as the usual frontispiece. In short the BULLETIN will maintain its usual position of "the leading photographic journal of America."

THE BULLETIN FOR 1891.

THE BULLETIN has gradually but steadily worked its way upwards in the ranks of American photographic literature until now it is second to none in the quality and quantity of material that it presents to its readers. The testimony of its ever-increasing subscription list is the best evidence that its course is appreciated by photographers. Its aim has always been for the advancement of photography in all its phases. It has advanced and nursed the best interests of the profession as well as offering every encouragement to the amateur.

Looking back over the past year the BULLETIN has been foremost in placing before American photographers the latest developments of the art. The eikogen developer was noticed in its pages, and its character described long before other journals even thought of its great value. Acid-sulphite was announced and its uses made practical to photographers in the United States for the first time in this journal. The results of the Congress of Photographers in Paris was

also noticed in this journal immediately on receipt of the reports on this side. The method for the reversal of the image by thio-carbamides was first seen by American readers in these pages. Primuline, the new printing material, also received the earliest extended notice in the pages of the BULLETIN. Our facilities for obtaining news from Europe and bringing it before our readers are not equaled by any other American photographic journal.

The contributors of original articles to the pages of the BULLETIN are in the first rank of both American and foreign photographic workers. There is not a name among them but tells of either high scientific or advanced practical ability.

In the matter of translations no other American journal attempts to reproduce from German and other sources the advanced class of articles on photographic subjects that have appeared in these pages. Many of these are reproduced in English photographic journals, and not always with an acknowledgment of the source whence they obtained them.

As usual our reports of societies are as full and as accurate as possible : in a great many cases fuller and more accurate than those of our contemporaries who ask more from their subscribers.

Our correspondence department is always an important feature of the journal, and its popularity remains as great as ever. We have never printed a question that has not come from a *bona fide* inquirer ; although there are journals where such queries are concocted in the office of the editor.

We are led to speak loudly in praise of what has been accomplished by the BULLETIN, because we are satisfied that the Editors and their staff have done everything in their power to make the journal the best in the United States. Every effort of theirs has been willingly seconded by us, and every dollar received as subscriptions has been expended in the interests of the journal. This being the case, it follows that the greater the number of our subscribers, the better we can make the journal. As the BULLETIN is not issued to pay dividends, but to encourage the art of photography, and as our facilities for the collection of photographic information are unsurpassed, we claim we can give our readers more good material for their money than they can obtain in any other manner. Therefore every subscriber has a personal interest in the work, and the greater the number of subscribers the better the results must be. Send your subscription early and help the good work along. Subscribe to the journal that has the largest circulation in the United States, and is therefore doing the greatest good to the greatest number.

E. & H. T. ANTHONY & Co.,
Publishers.

BULLETIN received and I am so well pleased with it that I would like you to send me the volume complete.

F. A. TILTON.

I am very much pleased with your BULLETIN, and would not be without it, it gives me so much pleasure.

JOHN YATES.

PLEASE see that I don't miss a number, as I want my volumes complete. Don't see how I can do without the BULLETIN.

J. C. F. PICKERILL.

HERE inclosed is amount due you in subscription to BULLETIN. Please always send it, as I find it an ever ready helper.

C. A. NEWMAN,
Indiana.

ANTHONY'S Photographic Bulletin.

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Prof. C. F. CHANDLER, Ph.D., LL.D.,
Aided by ARTHUR H. ELLIOTT, Ph.D., F.O.S.,
and a corps of practical assistants.

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Advertisements should reach us not later than the Saturday preceding the issue for which they are intended, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration before the date above mentioned, and to state for what period the advertisement should be continued—whether for one, six, twelve or twenty-four issues.

E. & H. T. ANTHONY & CO., Publishers.

CRANFORD CAMERA CLUB.

THE Cranford (New Jersey) Camera Club gave its second annual lantern exhibition at the Town Hall on November 20th. Over one hundred slides of local views were shown to a delighted audience. The slides were divided into three classes, landscapes, architectural, and figures, and at the end of each class there was an intermission of five minutes for music, which relieved the audience from the tediousness of looking at the screen continually for an hour and a half. The two following evenings, and again on the 26th and 29th, exhibitions of mounted pictures were given in the club rooms which were largely attended. This club, though not large in members, is an active one and has plans for very interesting work during the winter months.

LOWELL CAMERA CLUB.

THE second annual exhibition of photographic work by the Lowell Camera Club, held at Morrill's studio, from November 11th to 15th inclusive, was a success, and has given the public a better idea of the work of the

club than would be possible in any other way. There were twenty-two persons represented by three hundred and twenty-five prints, of all sizes to 8 x 10 inches.

It was the general opinion that the quality of this year's work was superior to that of any previous exhibition. This is the more satisfactory because it was the work of but one year, while the previous exhibitions by Lowell amateurs have generally been the work of two or more years combined.

A new departure was made this year in the awarding diplomas in the following classes: 1, Landscape and marine; 2, portraits; 3, animals; 4, genre and figure composition; 5, hand camera work.

The following persons were awarded diplomas:

William P. Atwood, class 1, landscape; John J. Coggeshall, classes 1 and 3, marine and animals; G. A. Nelson, classes 2 and 4, portrait and genre; and Miss Florence H. Whittier, 5, hand camera work.

Honorable mention was given to pictures in the exhibits of A. S. Guild, F. B. Murphy, W. B. Parkhurst, H. M. Thompson, Miss Helen A. Whittier, Rev. George Batchelor and W. H. Dodge.

The judges were Frank Russell, A. A. Ordway and W. P. Phelps.

The new illustrated subject by the club, entitled "Lowell Illustrated," that is to be contributed to the New England Lantern Slide Exchange, was shown before a large and appreciative audience in the Y. M. C. A. Hall, Thursday evening, November 20th. The set is limited to fifty slides, and shows Lowell in its work-day dress. Some of the most interesting objects of historic interest are included; but the mills, exterior and interior, form the principal part of the set. The descriptive text was written and read by Mr. W. P. Atwood.

The adjourned annual meeting was held immediately after the exhibition of the slides. It was unanimously voted to continue the club another year, and the matter of increasing the annual assessment was referred to a committee to consider and report.

The old board of officers was re-elected.

The board is William P. Atwood, President; Charles G. Glidden, Vice-President; H. W. Barnes, Treasurer; G. A. Nelson, Secretary.

It was voted to add a by-law providing for an executive committee, consisting of the officers and three other members. Paul Butler, Charles H. Allen and W. E. Badger

were elected as members of the executive committee, which is to have general charge of the affairs of the club.

Seven new members were elected at this meeting.

G. A. NELSON,

Secretary.

The following are details of the exhibition from a local source:

Charles H. Kohlrausch, of North Billerica, has two panels of views. One hanging in the middle of the room is a set of photos on glass, ready for stereopticon use, made up of views on the Canadian Pacific Railroad and scenes in and around New England. Another card bears a series of views of a mixed character and all are of excellent artistic quality.

Frank B. Murphy has a series of small views and one large landscape entitled "The Source of the Merrimac River," which is a very creditable and artistic piece of work.

Mr. A. S. Guild has half-a-dozen views in this section of the country that are charming, and his view of "Winn's Bluff," a spot dear to the familiars of the river, is a little gem in composition and finish. Mr. Guild's work is honored with a gold star of honorable mention.

Mr. W. P. Atwood always does good work, and his exhibit this year is of a character far above that of the average professional. His three landscapes, "First on a Hill Top," are given the diploma of landscape, and they are marked by nice artistic feeling and delicacy, clever composition and that nicety of cloud and sky effects which can only be produced by patience, care and knowledge. His work is of a high order and his chemical knowledge is a big factor in his success and technique.

Mr. W. P. Parkhurst has some nice marines and landscapes, and Mr. B. E. Whittier, of Lexington, has a very commendable exhibit of scenes locally interesting in the old historic town.

Mr. H. M. Thompson carried his camera far afield, and his views were evidently made face to face with nature, for the scenes are from Maine and Canadian woods, and reminiscent of the hunter's camp.

O. B. Silver has some very excellent work, somewhat marred by his intense lights and shades, the result probably of over exposure.

Mr. George A. Nelson, like Mr. Atwood, is one of the cleverest men in the club, and his genre and portrait work is highly artistic and well worthy of the diploma awarded him. His two haying scenes are admirable, and the

hay-laden ox-wagon with the group of men working around it is really a work of art. The old shoemaker at his bench is a gem, and the two men grinding a scythe is delightful. He has some nice landscapes, and his portrait entitled "Waiting for the Train," is a good likeness of our old friend Bickford Lang. Professional photographers can learn from this amateur.

Messrs. Willard M. Foster, H. Sargent Brown, Fred Wiggin, W. H. Dodge, George Batchelor, Philip R. Hovey, C. F. Lawrence, of Lexington, and Mrs. Alfred Sawyer, all have very creditable exhibits.

Mr. W. J. G. Myers, of the *Citizen*, went to Europe some time ago, and some of the results of his tour hang on the walls under the title of "Glimpses of Italy." The exhibit is a very interesting one, and covers an expanse of territory historically famous and scenically interesting.

Miss Florence H. Whittier and Miss Helen A. Whittier have a number of interesting sketches which were "snapped" on the fly from Massachusetts to Michigan, and which are skillfully finished and mounted with breezy sketchiness.

Mr. John I. Coggeshall has a handsome exhibit of landscapes, marines and animal views, his work in the two latter branches bringing him a diploma. They make a charming collection and display a distinctly artistic bent of mind.

Taken as a whole the exhibit is one of great artistic excellence and shows that the club has organized to good purpose. Its exhibit cannot fail to stimulate an increased interest in this delightful pastime which makes health and pleasure wait on art. An interesting feature of Mr. Myers' exhibit is two sprigs of eidelweiss, that beautiful and rare blossom of the Swiss Alps, which are fixed among some views of the heights upon which they bloom.

NEW YORK CAMERA CLUB.

THE room of the Camera Club was filled to overcrowding on the evening of December 18th, Professor James E. Keeler being down for a lecture on "Astronomical Photography as practiced at the Lick Observatory."

The President, Mr. David Williams, announced that on Monday next Dr. Leo Backelandt would talk upon the nature of emulsions, sensitometric measurements, etc., and would demonstrate the method of preparing an emulsion and of flowing it on a plate. On succeeding Monday evenings they had talks

promised by Dr. Devlin on Lenses, by Mr. Wainwright on Development, and by Dr. A. H. Elliott on Fixing.

The President, in a few well chosen words, introduced Professor Keeler, whose remarks were followed with the greatest interest. The lecture was illustrated by means of the optical lantern, and a well-selected series of views of the observatory and of several of the heavenly bodies were shown. Among the most interesting slides shown were several of the huge 57-foot telescope, its complicated eyepiece, photographic appliances and spectroscopic attachments. Professor Keeler's remarks will be given in full in another part of the BULLETIN.

A hearty vote of thanks, carried by acclamation, was tendered to the professor, and the most successful meeting yet held by the Camera Club was brought to a close.

BROOKLYN INSTITUTE—PHOTOGRAPHIC SECTION.

A LARGE and appreciative audience filled the room of the Brooklyn Y. M. C. A. on December 9th, the occasion being the meeting of the above section. The chair was taken at 8.20 P.M. by the *President*, Mr. BLACK. After disposing of the usual routine business, the Chairman introduced Miss Catharine Weed Barnes. Miss Barnes was greeted with the greatest enthusiasm, and her paper on "The Real and the Ideal" was followed with the utmost attention, every telling hit being accorded applause.

In the course of her remarks, Miss Barnes pointed out that the ideal of one was not the ideal of another, nor is the ideal in camera work of to-day the ideal of to-morrow. Her ideal was a high one, but as soon as it is realized another takes its place. We move so fast in this nineteenth century of ours that it requires our best efforts to keep us abreast of the times. To keep ourselves posted on the many improvements in materials and processes all ought to read as many as possible of the periodicals published.

Admirers of a certain kind of camera were much in favor of an universal focus arrangement, but these button-pressers rarely rise above the mere mechanical part of the art. It is well to understand at the outset that there is no royal road to success, nor should anything be left to mere chance. Study the whole subject from the beginning with the determination to be successful and to produce artistic results. Good work can only be

obtained by hard work, plenty of patience and indomitable perseverance.

Do not undervalue your camera. It is to you what the brush is to the artist. Remember, too, it is possible to become a photographer though one may not have the capacity to become an artist.

The great interest shown in our art could not be more forcibly demonstrated than by the formation of the National Association last week. I have faith in this movement and believe that we are starting what will be a great power in the hands of the amateur and a factor which will enable him to realize his ideals, to make them realities.

A very interesting series of lantern slides were thrown on the screen, those of Miss Barnes' including her Enoch Arden series. Several slides by members of the Institute followed, these showing in many instances very careful and artistic work.

A vote of thanks to Miss Barnes was heartily indorsed by the meeting.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

THIS society held its regular monthly meeting on December 9th, in the comfortable rooms at 113 West 38th street. The library is at present an object of considerable interest, its walls being adorned with some of the work of the Pacific Coast Photographic Society.

The meeting was called to order at 8 P.M., and the minutes being read and confirmed, President Stebbins gave a brief description of his recent trip to Europe, and exhibited and described several novel pieces of apparatus, the products of Parisian ingenuity.

Among the many novelties he had come across were a pocket-book camera; a book camera, the interior of which is divided into six squares, each carrying a plate, the lens being moved to position in front of each plate in succession. Perhaps the most interesting thing exhibited was a revolver flash lamp. The flame for the ignition of the powder is from a wick dipping in alcohol. The pressure of a bulb forces pure magnesium powder through the flame, giving a very intense flash. The turning of a crank suffices for reloading. The whole apparatus is very small, and when fully charged carries sufficient material for twenty flashes.

A device for indicating the best time of day for exposing on any particular object was also a source of interest. It is a small instrument

similar to a compass; the needle is pointed toward the object and the time read off at the opposite end. A new candle dark room lamp of elaborate brass work was much admired. Leon Vidal's and Decoudun's photometers also formed part of the president's collection.

A new form of transparency excited considerable comment. Parchment is coated with a solution somewhat similar to that used on ferro-prussiate paper, and the printing and washing done in a similar manner. The result is a blue transparency, very pretty, and should become popular. Specimens of prints on silk sensitized by Nadar were also shown. These were of a brown sepia color and very interesting for comparison with prints obtained on similar material by the primuline process, as demonstrated at the last meeting by Mr. T. C. Roche.

Zion & Co.'s finder, a stereoscope lens and mirror at 45 degrees, very neatly mounted, and the Prazmosky lens were also subjects of discussion.

Marion & Co.'s focusing glass, which is attachable to the ground glass by simple pressure, thus leaving the hands free, was also exhibited.

A new developer and an umbrella tripod completed a most interesting collection.

Mr. Beach presented an outline report of the meeting held December 4th to form a national association for amateurs. The name decided on was, he said, the American Photographic Conference. To be governed by a council. Subscription to be \$3 yearly. Each society to send one delegate for every five members, these delegates alone having the right to vote, and thus it was said avoiding the introduction of trade influence. The first conference is to be held in New York, beginning April 21st. An exhibition in connection with it will be open for one week.

The meeting then entered into a discussion of the proposed revision of the constitution. Mr. Dayton, in introducing it, said that for some time general ignorance had prevailed with regard to the present constitution, and the Board of Directors had thought it advisable to draw up one as complete and lucid as possible, and to place copies of it in the hands of each member. With few alterations the revised constitution was carried. Among the changes are: the abolition of corresponding members, that is, that in future such members will be ranked as subscribing members, this change not to affect those already on the books of the society as corresponding mem-

bers; and the abolition of the sinking or reserve fund.

EXPLOSION OF AN OXYGEN GAUGE.—On Monday last, before Mr. Justice Denman and a special jury, Mr. Joshua Dyson, who resides at Rochdale and is the proprietor of a diorama and public entertainment, sued the Brin's Oxygen Company to recover damages for personal injuries sustained under somewhat peculiar circumstances. The plaintiff, it appeared, had purchased of the defendants two steel cylinders for holding compressed oxygen and hydrogen gases, and a tubular gauge for testing the pressure of the gas. In the course of testing, the gauge gave way and exploded, with the result that the plaintiff was struck in the face by a piece of metal, and was so badly injured that he lost the sight of one eye, and the other eye was so injured that he was in danger of losing that also. The plaintiff's case was that the tube was made of bad material, that the workmanship was defective, and that the gauge was unfit for the use for which it was intended. The defendants, who obtained the gauge from a firm of gauge-makers, denied that there was any defect in its manufacture, or that it was made negligently, or that there was any negligence on their part. The jury found for the plaintiff, and judgment was given for £325, the amount of damages agreed upon between the parties.—*British Journal of Photography*.

What Our Friends Would Like to Know.

N. B.—We cannot undertake to answer questions of a technical character except through the columns of the BULLETIN. Correspondents will please remember this. No attention will be paid to anonymous communications.

Q.—H. B. N. writes: The formula for preparing bitumen calls for methylated ether, which cannot be obtained here. Can you inform me where I can get it, or if there is a substitute?

A.—Methylated ether is not made in this country; but common concentrated ether will answer the purpose equally well.

Q.—S. E. R. writes: Referring to the beautiful views of Mr. Robinson, reproduced in the BULLETIN for November 22d, can you say whether they show real English clouds from nature? If they were American views I should think the clouds were "hand made."

A.—We do not know how the clouds were produced; but you must remember that the photogravure reproductions give a grain to the pictures that is not perceptible in the originals. The clouds were probably printed in from special cloud negatives, as many of

Mr. Robinson's pictures are the result of combination printing from several negatives.

Q.—L. L. R. writes: Please tell me through the columns of the BULLETIN how many grains of metallic gold is required to tone twenty sheets of extra brilliant N. P. A. paper? Also, how many grains of gold chloride are necessary? Also, how strong the silver bath should be at 70 degrees Fahr.; and how long should paper be floated? My toning bath is 1 grain of metallic gold to 1 ounce of water. How many sheets of paper will be silvered by each ounce of silver bath?

A.—One sheet of albumen paper 18 x 22 requires 1 grain of metallic gold to tone it as an average; but the depth of the print makes considerable difference. The bath should be above 50 grains of silver nitrate to the ounce. Float one and a half to two minutes on such a bath. We do not understand last question; please repeat.

Q.—F. C. writes: Will you please answer through the next BULLETIN if the formulas on page 688 of the last BULLETIN for making enlargements on canvas can be used on paper for making enlargements, and if they would be permanent? If not, can you give any formulas for working paper in that way?

A.—There is no reason why the method should not be applied to paper, if the latter is of good quality (fine drawing paper) and fixed on a stretcher. The prints should be permanent if carefully fixed and washed thoroughly. It would be best to size the paper pretty thoroughly with gelatine (say 5 grains to the ounce of water) and allow to dry, before applying the potassium bromide and gelatine, as given in the formula.

Views Caught with the Drop Shutter.

THE Genelli Photographic Supplies Company, capital \$20,000, filed articles of incorporation in the Recorder's office, November 26th. The stockholders are D. F. Hulbert, 198 shares, and W. H. Clark and H. A. Loevey, one share each.—*St. Louis Democrat.*

A QUEER DECISION.—City of New Orleans vs. Louis Robira.—Although the Constitution exempts from a license tax those who are engaged in a mercantile pursuit, it does not follow that a photographer comes within the immunity. Photography is a science, at least a liberal art. A photographer is an artist who practices an occupation in which the mind is chiefly concerned, the hands and body being less so. Legislative acts are entitled to great respect, and are presumed to be constitutional, and to destroy the presumption they must be shown manifestly to violate the organic law. In this case, the ordinance and statute assailed are constitutional and valid. Those who seek shelter under an exemption law must present a clear case free from all doubt, as such laws, being a derogation of a general rule, must be strictly construed. Plausible hesitation warrants an adverse finding. Judgment reversed and judgment for plaintiff.—*New Orleans Picayune.*

Mr. GAYTON A. DOUGLASS, of Chicago, gave us a call recently, and is still in New York.

W. H. JACKSON, of Denver, has been down South among the cotton fields and sugar canes. We hope to see some fine pictures of these regions at an early date.

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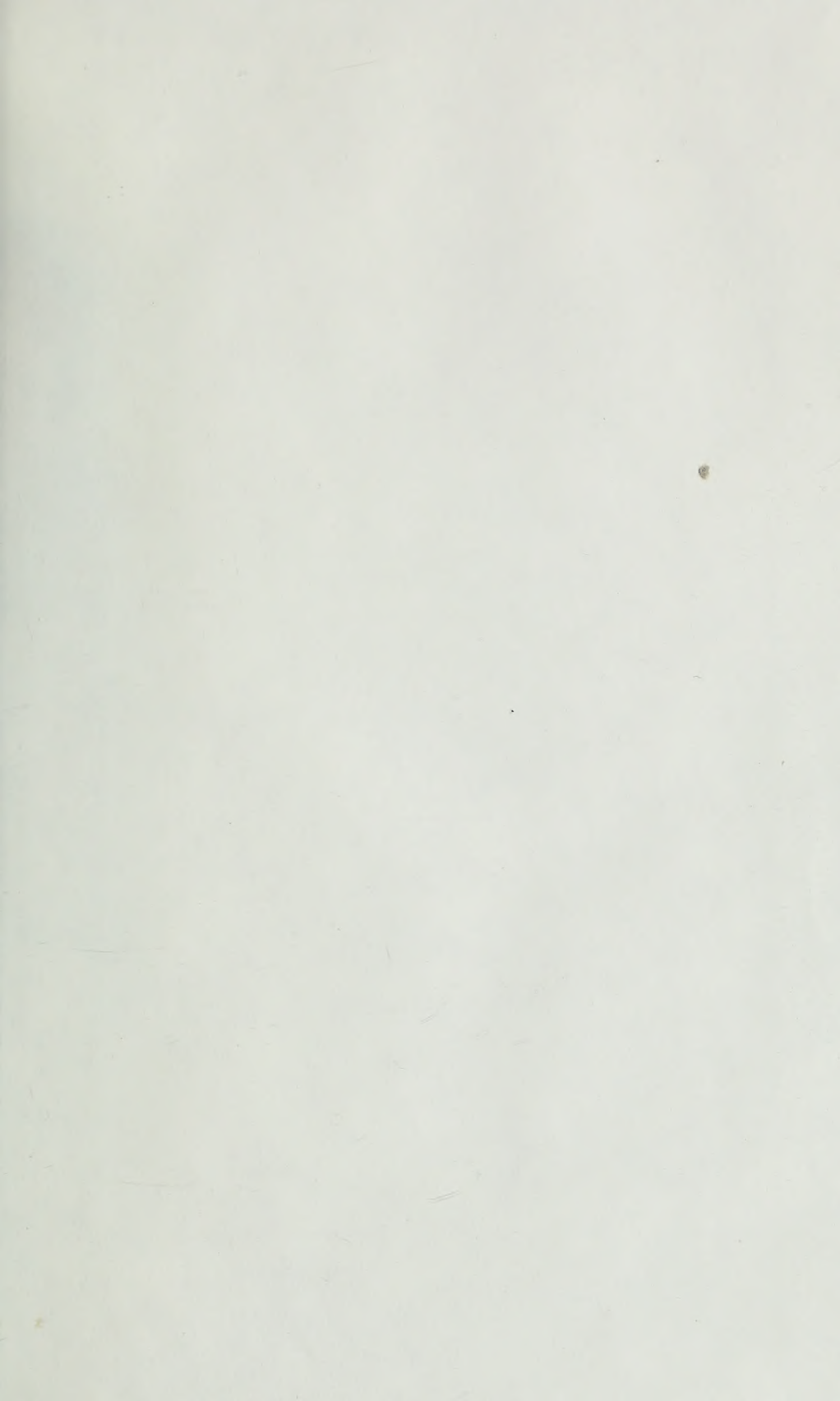
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